

Pollinator Habitat Assessment and Establishment on Organic Farms



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Major support from the West National Tech Support Center and a USDA-NRCS Conservation Innovation Grant.





THE XERCES SOCIETY FOR INVERTEBRATE CONSERVATION

Since 1971, the Society has worked to protect wildlife through the conservation of invertebrates and their habitat.

Major Programs:

- Endangered species
- Aquatic invertebrates
- Pollinator conservation



Xerces blue butterfly (*Glaucopsyche xerces*), the first U.S. butterfly to go extinct due to human activities



The Xerces Society Agricultural Pollinator Conservation Program

- Habitat Restoration on Farms
- Documenting At-Risk Pollinators
- Applied Research

Joint Staff Biologist Positions

- USDA-Natural Resources Conservation Service (NRCS)
- University of Minnesota Extension

Staff Backgrounds

- Farming, restoration, entomology, plant ecology, wildlife conservation, bee-keeping, and native seed production





Webinar overview:

Part 1:

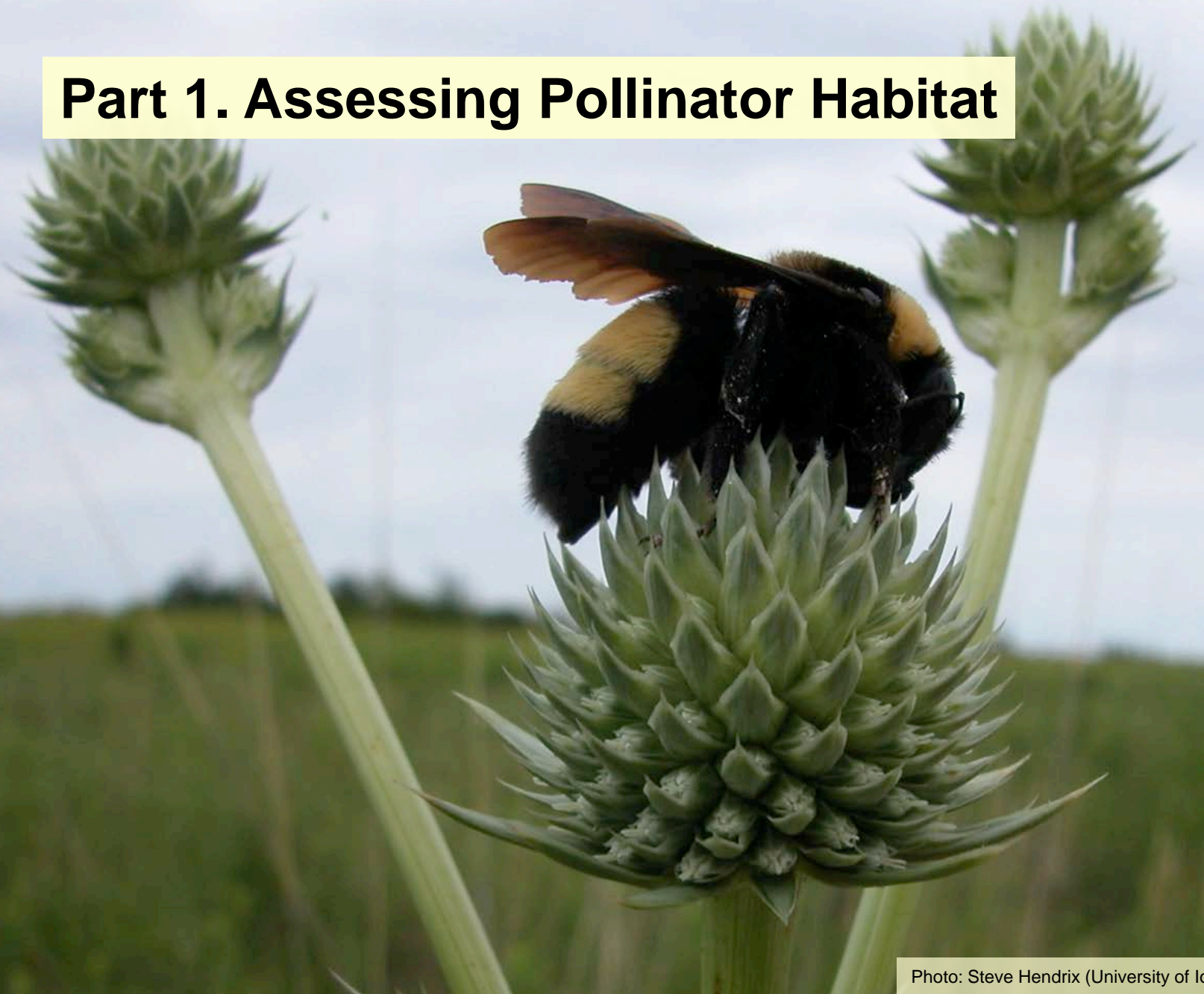
- Pollinator conservation, the National Organic Rule, and the 2008 Farm Bill
- Pollinator habitat needs and habitat assessment

Part 2

- Pollinator habitat restoration guidelines
- Case studies of CIG-funded demonstration projects
- Additional resources and wrapping it up



Part 1. Assessing Pollinator Habitat





Organic defined by the USDA:

“A production system that is managed...by integrating cultural, biological, and mechanical practices that foster cycling of resources, promote ecological balance, and conserve biodiversity” (7 CFR 205.2)

Organic Food Production Act, 1990





2008 Farm Bill

- Makes pollinators a priority for every USDA land manager and conservationist
- Identifies pollinator habitat as a priority for EQIP
- Encourages the inclusion of pollinators in all USDA conservation programs





Non-Crop Habitat

The amount of natural habitat on a farm has a direct influence on pollinator abundance and diversity





To help conservation planners and landowners, we developed a Pollinator Habitat Assessment Form and Guide



Native Bee Conservation

Pollinator Habitat Assessment Guide for Organic Farms



June 2011

The Xerces Society for
Invertebrate Conservation

www.xerces.org



Overview of assessment guide:

- Meant to facilitate the planning process:
 - prioritize projects
 - identify major issues and/or opportunities
- Assessing 4 broad categories
 - Nesting sites
 - Foraging habitat
 - Other landscape features
 - Farm management

1a. Sites for ground-nesting bees.

Ground nests are often marked by a small mound of excavated soil, but may also be nothing more than a small hole in the ground. Nests may be dug in bare soil, areas of patchy vegetation, or hidden among plants. They are usually in marginal areas such as ditch banks or track sides, and frequently can be found close to buildings or other structures. (Photos below illustrate some nest sites.)

| SCORE ALL OPTIONS THAT APPLY (A = abundant, M = moderate, N = scarce) | Score | Before | After | Treatment to increase score |
|---|--------------------------|--------|-------|-----------------------------|
| Areas of well-drained bare ground, or with sparse vegetation | A = 10 M = 5 N = 1 | | | |
| Areas with sandy to sandy loam soil | A = 10 M = 5 N = 1 | | | |
| No-till cropping system: 1 point for every 10% of area untilled | 0 - 10 | | | |
| Areas with bare but compacted soil, or excavated soil | 1 | | | |
| <i>Subtotal (1a)</i> | | | | |

1b. Sites for wood- and cavity-nesting bees.

Wood-nesting bees occupy pre-existing tunnels or cavities in wood, the center of pruned botanical rodent burrows or under clump-forming bunch grasses. (Photos below illustrate some nest sites.)

Treatment to increase score

Go to top of page 5

Site Summary

| | |
|-----------------------|--|
| Owner/Operator: | |
| County: | |
| Field Office: | |
| Planner: | |
| Date: | Assessment Before Implementation (Existing Habitat): |
| | Assessment After Implementation: |
| Location Description: | |
| Sketch of Site: | |

Total Score for Habitat Assessment

The figures entered into this summary table will be calculated during completion of the assessment.

| | Before | After |
|---------------------------------------|--------|-------|
| Section 1: Native Bee Nesting Habitat | | |
| Section 2: Foraging Habitat | | |
| Section 3: Landscape Features | | |
| Section 4: Farm Practices | | |
| OVERALL SCORE | | |



Overview of assessment guide:

- Subjective and does not allow us to compare farms
- Compare and document pre- and post-conservation condition
- Asked to score land attributes that may not be relevant for a particular site

1a. Sites for ground-nesting bees.

Ground nests are often marked by a small mound of excavated soil, but may also be nothing more than a small hole in the ground. Nests may be dug in bare soil, areas of patchy vegetation, or hidden among plants. They are usually in marginal areas such as ditch banks or track sides, and frequently can be found close to buildings or other structures. (Photos below illustrate some nest sites.)

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Wood-nesting bees occupy pre-existing tunnels or cavities in wood, the center of pruned botanical rodent burrows or under clump-forming bunch grasses. (Photos below illustrate some nest sites.)

| Score | Before | After | Treatment to increase score |
|-------|--------|-------|-----------------------------|
| | | | |

[Go to top of page 5](#)

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| Section 3: Landscape Features | | |
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Habitat Assessment: Nesting Habitat

1a. Sites for ground-nesting bees.

Ground nests are often marked by a small mound of excavated soil, but may also be nothing more than a small hole in the ground. Nests may be dug in bare soil, areas of patchy vegetation, or hidden among plants. They are usually in marginal areas such as ditch banks or track sides, and frequently can be found close to buildings or other structures. (Photos below illustrate some nest sites.)

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| Areas with sandy to sandy loam soil | A = 10 M = 5 S = 1 | | | |
| No-till cropping system: 1 point for every 10% of area untilled | 0 - 10 | | | |
| Areas with bare but compacted soil, or excavated soil | 1 | | | |
| <i>Subtotal (1a)</i> | | | | |

Bee Nesting Habitat





Section 1: Native

1b. Sites for wood- and cavity-nesting bees.

The great majority of wood- or cavity-nesting bees do not excavate their own nest; they occupy pre-existing tunnels or cavities in snags, the center of pithy-stemmed shrubs, and in brush piles. Bumble bees frequently nest in abandoned rodent burrows or under clump-forming bunch grasses. (Photos below illustrate some nest sites.)

| SCORE ALL OPTIONS THAT APPLY A = abundant, M = moderate, S = scarce | Score | Before | After | Treatment to increase score |
|--|--------------------------|--------|-------|-----------------------------|
| Dead wood, brush piles, or snags present | A = 10 M = 5 S = 1 | | | |
| Pithy twigs (elderberry, cane fruit, sumac, etc.) | A = 10 M = 5 S = 1 | | | |
| Overgrown native bunch grasses (clump-forming) present | 3 | | | |
| <i>Subtotal (1b)</i> | | | | |

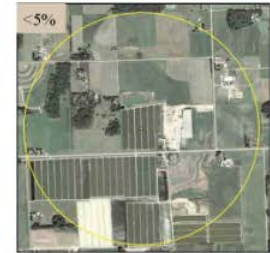
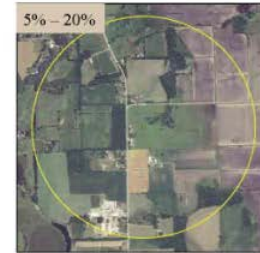




Section 2: Foraging Habitat

2a. Percent of natural vegetation within ½ mile of site.
The photos below illustrate these different categories.

| SELECT ONLY ONE | Score | Before | After | Treatment to increase score |
|----------------------|-------|--------|-------|-----------------------------|
| > 30% | 10 | | | |
| 20% – 30% | 7 | | | |
| 5% – 20% | 3 | | | |
| < 5% | 0 | | | |
| <i>Subtotal (2a)</i> | | | | |



2b. Dominant vegetation in non-cropped area within ½ mile of site.

| SELECT ONLY ONE | Score | Before | After | Treatment to increase score |
|---|-------|--------|-------|-----------------------------|
| Native plants | 10 | | | |
| Mix of native and naturalized (non-invasive) plants | 7 | | | |
| Naturalized flowering species (e.g., alfalfa) | 5 | | | |
| Invasive flowering weeds | 0 | | | |
| Sod-forming grasses | 0 | | | |
| <i>Subtotal (2c)</i> | | | | |



Continue here

2c. Percentage of vegetative cover (non-crop area) that is forbs or flowering shrubs within ½ mile of site.

The photos below illustrate some categories. See regional technical notes (listed on page 8) for lists of preferred pollinator plants and other information.

| SELECT ONLY ONE | Score | Before | After | Treatment to increase score |
|-----------------|-------|--------|-------|-----------------------------|
| > 85% cover | 10 | | | |
| 45% – 85% cover | 7 | | | |
| 30% – 45% cover | 5 | | | |
| 20% – 30% cover | 3 | | | |
| < 20% cover | 1 | | | |

Subtotal (2c)

Habitat (cont.)





Section 2: Foraging Habit

2d. Number of species of forbs and flowering shrubs on farm that bloom in spring (including crops).

| SELECT ONLY ONE | Score | Before | After | Treatment to increase score |
|-----------------|-------|--------|-------|-----------------------------|
| 5+ species | 10 | | | |
| 3 – 4 species | 5 | | | |
| 1 – 2 species | 3 | | | |
| 0 species | 0 | | | |
| Subtotal (2d) | | | | |

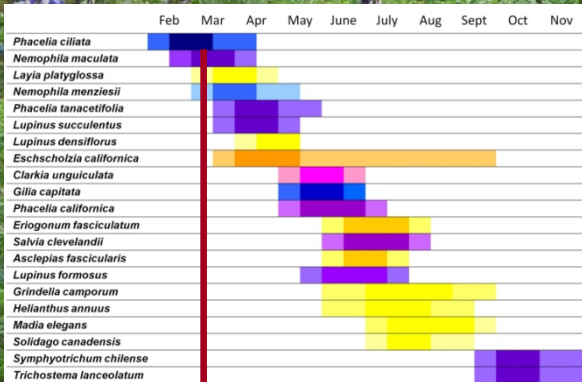
2e. Number of species of forbs and flowering shrubs on farm that bloom in summer (including crops).

| SELECT ONLY ONE | Score | Before | After | Treatment to increase score |
|-----------------|-------|--------|-------|-----------------------------|
| 5+ species | 10 | | | |
| 3 – 4 species | 5 | | | |
| 1 – 2 species | 3 | | | |
| 0 species | 0 | | | |
| Subtotal (2e) | | | | |

2f. Number of species of forbs and flowering shrubs on farm that bloom in fall (including crops).

| SELECT ONLY ONE | Score | Before | After | Treatment to increase score |
|-----------------|-------|--------|-------|-----------------------------|
| 5+ species | 10 | | | |
| 3 – 4 species | 5 | | | |
| 1 – 2 species | 3 | | | |
| 0 species | 0 | | | |
| Subtotal (2f) | | | | |

Foraging Habitat Total ← (2a + 2b + 2c + 2d + 2e + 2f) →



NRCS Plant Materials Center, Lockeford, CA



Habitat Assessment: Forage on the Farm



Section 2: Foraging Habit

2d. Number of species of forbs and flowering shrubs on farm that bloom in spring (including crops).

| SELECT ONLY ONE | Score | Before | After | Treatment to increase score |
|----------------------|-------|--------|-------|-----------------------------|
| 5+ species | 10 | | | |
| 3 – 4 species | 5 | | | |
| 1 – 2 species | 3 | | | |
| 0 species | 0 | | | |
| <i>Subtotal (2d)</i> | | | | |

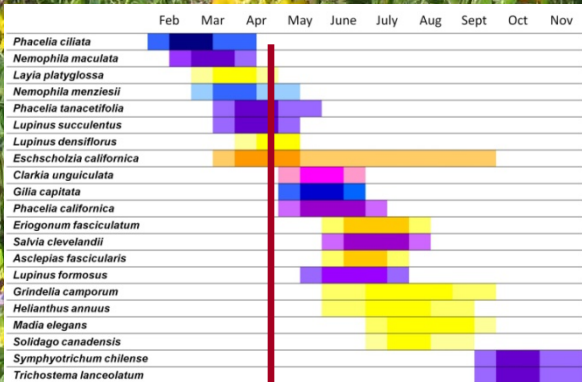
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| SELECT ONLY ONE | Score | Before | After | Treatment to increase score |
|----------------------|-------|--------|-------|-----------------------------|
| 5+ species | 10 | | | |
| 3 – 4 species | 5 | | | |
| 1 – 2 species | 3 | | | |
| 0 species | 0 | | | |
| <i>Subtotal (2e)</i> | | | | |

2f. Number of species of forbs and flowering shrubs on farm that bloom in fall (including crops).

| SELECT ONLY ONE | Score | Before | After | Treatment to increase score |
|----------------------|-------|--------|-------|-----------------------------|
| 5+ species | 10 | | | |
| 3 – 4 species | 5 | | | |
| 1 – 2 species | 3 | | | |
| 0 species | 0 | | | |
| <i>Subtotal (2f)</i> | | | | |

Foraging Habitat Total ← (2a + 2b + 2c + 2d + 2e + 2f) →



NRCS Plant Materials Center, Lockeford, CA



Habitat Assessment: Forage on the Farm



Section 2: Foraging Habit

2d. Number of species of forbs and flowering shrubs on farm that bloom in spring (including crops).

| SELECT ONLY ONE | Score | Before | After | Treatment to increase score |
|-----------------|-------|--------|-------|-----------------------------|
| 5+ species | 10 | | | |
| 3 – 4 species | 5 | | | |
| 1 – 2 species | 3 | | | |
| 0 species | 0 | | | |
| Subtotal (2d) | | | | |

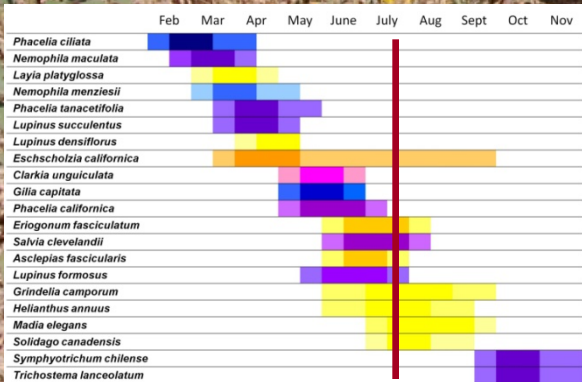
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| SELECT ONLY ONE | Score | Before | After | Treatment to increase score |
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| 5+ species | 10 | | | |
| 3 – 4 species | 5 | | | |
| 1 – 2 species | 3 | | | |
| 0 species | 0 | | | |
| Subtotal (2e) | | | | |

2f. Number of species of forbs and flowering shrubs on farm that bloom in fall (including crops).

| SELECT ONLY ONE | Score | Before | After | Treatment to increase score |
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| 5+ species | 10 | | | |
| 3 – 4 species | 5 | | | |
| 1 – 2 species | 3 | | | |
| 0 species | 0 | | | |
| Subtotal (2f) | | | | |

Foraging Habitat Total ← (2a + 2b + 2c + 2d + 2e + 2f) →



NRCS Plant Materials Center, Lockeford, CA



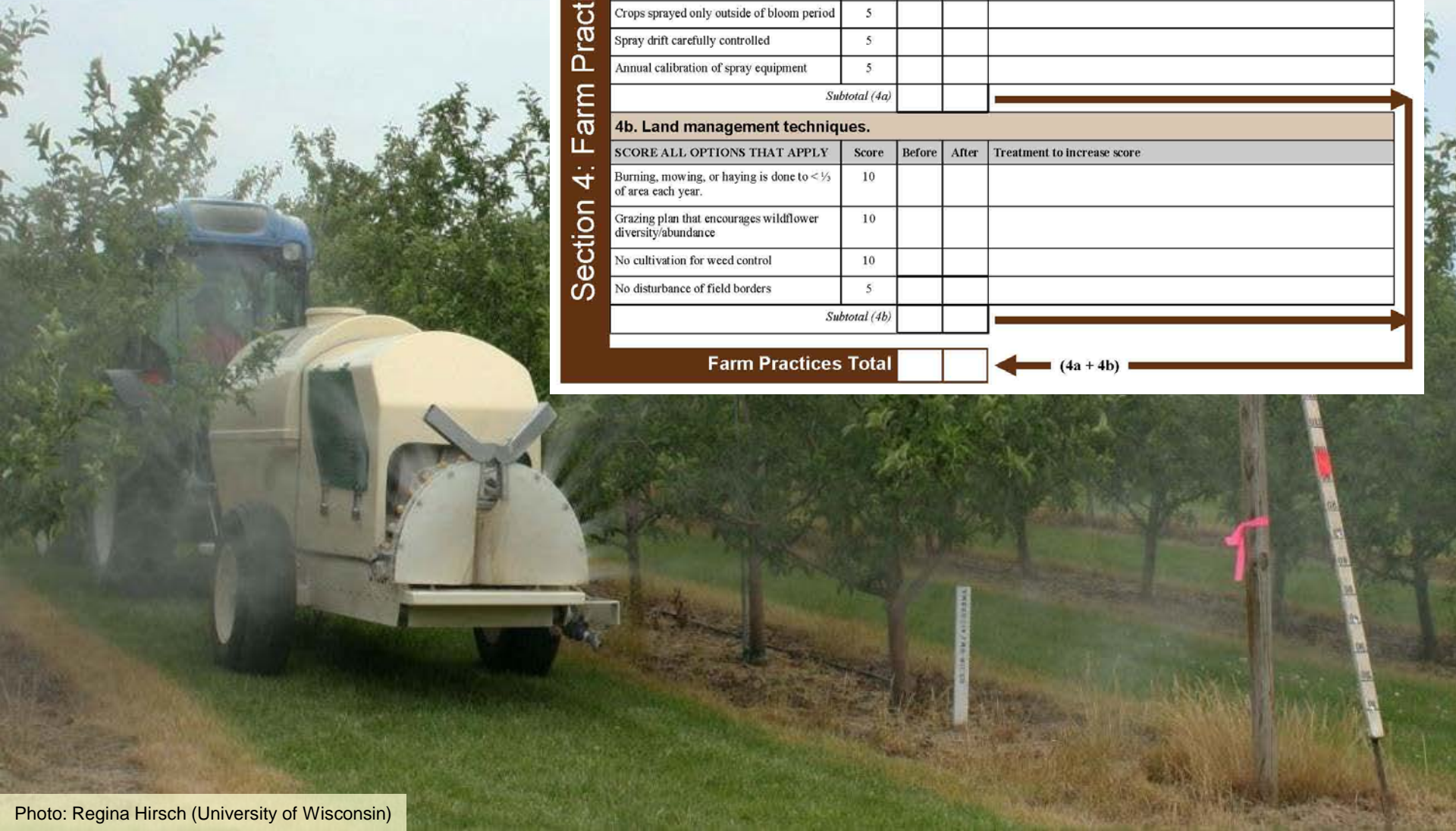


Section 3: Landscape Features

| 3a. Average field size. | | | | | |
|-------------------------|-------|--------|-------|-----------------------------|--|
| SELECT ONLY ONE | Score | Before | After | Treatment to increase score | |
| < 5 acres | 10 | | | | |
| 5 – 10 acres | 5 | | | | |
| 10 – 50 acres | 3 | | | | |
| > 50 acres | 1 | | | | |
| <i>Subtotal (3a)</i> | | | | | |

| 3b. Additional landscape features within one mile. | | | | | |
|---|-------|--------|-------|-----------------------------|--|
| SCORE ALL OPTIONS THAT APPLY | Score | Before | After | Treatment to increase score | |
| Riparian buffers: 1 point for every 20% of area within 25 feet of water feature that is vegetated | 0 – 5 | | | | |
| Hedgerows, windbreaks, or fencerows of diverse tree/shrub species | 5 | | | | |
| Flowering cover crops, bee pasture, bolting crops | 5 | | | | |
| Source of clean surface water (non-contaminated) | 3 | | | | |
| <i>Subtotal (3b)</i> | | | | | |

Landscape Features Total **(3a + 3b)**



Section 4: Farm Practices

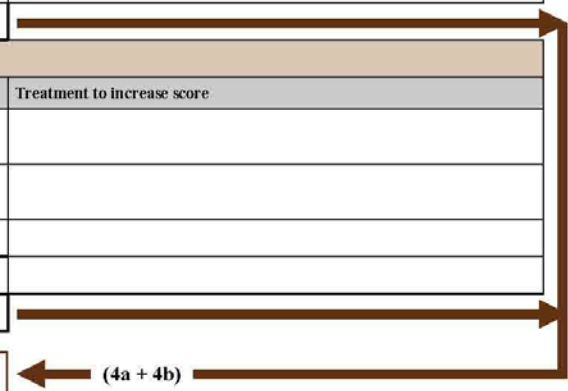
| 4a. Use of pesticides. | | | | |
|--|-------|--------|-------|-----------------------------|
| SCORE ALL OPTIONS THAT APPLY | Score | Before | After | Treatment to increase score |
| No use of any insecticides | 40 | | | |
| IPM program in place | 10 | | | |
| Insecticides sprayed at night | 5 | | | |
| Crops sprayed only outside of bloom period | 5 | | | |
| Spray drift carefully controlled | 5 | | | |
| Annual calibration of spray equipment | 5 | | | |
| <i>Subtotal (4a)</i> | | | | |
| 4b. Land management techniques. | | | | |
| SCORE ALL OPTIONS THAT APPLY | Score | Before | After | Treatment to increase score |
| Burning, mowing, or haying is done to < 1/3 of area each year. | 10 | | | |
| Grazing plan that encourages wildflower diversity/abundance | 10 | | | |
| No cultivation for weed control | 10 | | | |
| No disturbance of field borders | 5 | | | |
| <i>Subtotal (4b)</i> | | | | |
| Farm Practices Total | | | | (4a + 4b) |

Photo: Regina Hirsch (University of Wisconsin)



Section 4: Farm Practices

| 4a. Use of pesticides. | | | | |
|--|-------|--------|-------|-----------------------------|
| SCORE ALL OPTIONS THAT APPLY | Score | Before | After | Treatment to increase score |
| No use of any insecticides | 40 | | | |
| IPM program in place | 10 | | | |
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| Spray drift carefully controlled | 5 | | | |
| Annual calibration of spray equipment | 5 | | | |
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| Grazing plan that encourages wildflower diversity/abundance | 10 | | | |
| No cultivation for weed control | 10 | | | |
| No disturbance of field borders | 5 | | | |
| <i>Subtotal (4b)</i> | | | | |
| Farm Practices Total | | | | |





Conventional farm version also available...

mace@xerces.org

<http://www.xerces.org/pollinator-resource-center/>



THE XERCES SOCIETY
FOR INVERTEBRATE CONSERVATION

Native Bee Conservation

Pollinator Habitat Assessment Form and Guide



June 2011

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www.xerces.org

Part 2. Restoring Pollinator Habitat





Seeding New Habitat:

Remove weeds prior to planting

Do not disturb dormant weed seed

Make a clean seed bed

Use appropriate planting technology

Plant seed during the dormant season (usually)

Manage weeds





Site Preparation for Conventional Farms:

- Chemical fallow (glyphosate) for a full growing season





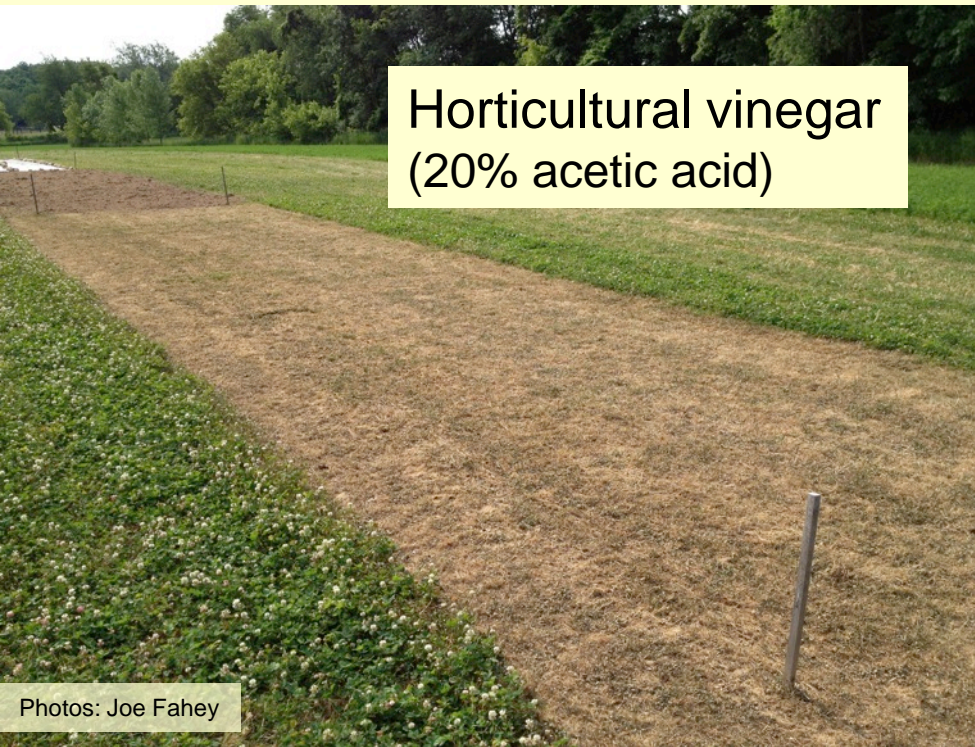
Site Preparation for Organic Farms

Three Approaches:

- Solarization
- Horticultural Vinegar
- Smother crops



Smother crop (Buckwheat)



Horticultural vinegar
(20% acetic acid)



Solarization



Solarization

- Treatment for at least 1 year
- UV stabilized high tunnel plastic
- Bury the edges
- Mow and irrigate before use





Site Prep: Remove Weeds Prior to Planting

Use only UV-stabilized plastic!





Horticultural Vinegar

- 20% acetic acid
- Repeat applications needed
- Limited effect on grasses
- Hazardous and not labeled as a herbicide



Smother Crops

- Planting time is critical (beat the weeds)
- Buckwheat (and sudan grass)
- Continuous cover for a full season
- Mow before seed set
- Requires irrigation

A photograph of a field of buckwheat plants. The plants are green with clusters of small white flowers. A white rectangular sign is placed in the field, with the word "buckwheat" printed on it in black lowercase letters. The background shows a line of trees under a clear sky.

buckwheat



Smother Crops

- Planting time is critical (beat the weeds)
- Buckwheat (and sudan grass)
- Continuous cover for a full season
- Mow before seed set
- Requires irrigation





Other Organic Options

- Repeat cultivation? Uh...no.
- Flame weeding? In a drought year?
- Newer organic herbicides (e.g. citrus oil formulations)? ...maybe!





Seeding: Create a Clean Seed Bed

Seed Bed Preparation:

- Burn or rake off debris
- Light harrowing is okay, deep tillage is not
- Do not bring more dormant weed seed to the surface

Not ready for planting!



Ready for planting!





Preparing to Seed:

- Plant in the dormant season (usually)
- Bulk up the seed mix with an inert carrier (e.g. sand) – for broadcasting





Use the Seeding Technology That You Have

- Native Seed Drills
- Brillion Drop Seeder
- Broadcast Seeder/Spreaders
- Hand Seeding





Immediately After Seeding:

- Roll seed into soil surface

The Year After Seeding:

- Weed site as needed
 - Mow to prevent annual weeds from re-seeding
 - Hand weeding!
 - Grass-selective herbicides



Photo: Don Sturm

Mow the wild radish to find...



wildflower seedlings underneath!



Photos: Eric Mader



Transplants:

- Supplemental irrigation
- Mulch / Fabric
- Animal guards
- Mechanical transplanters





The Finished Product!

The Finished Product!





The Finished Product!
Lockeford Plant Materials Center



2011

2010

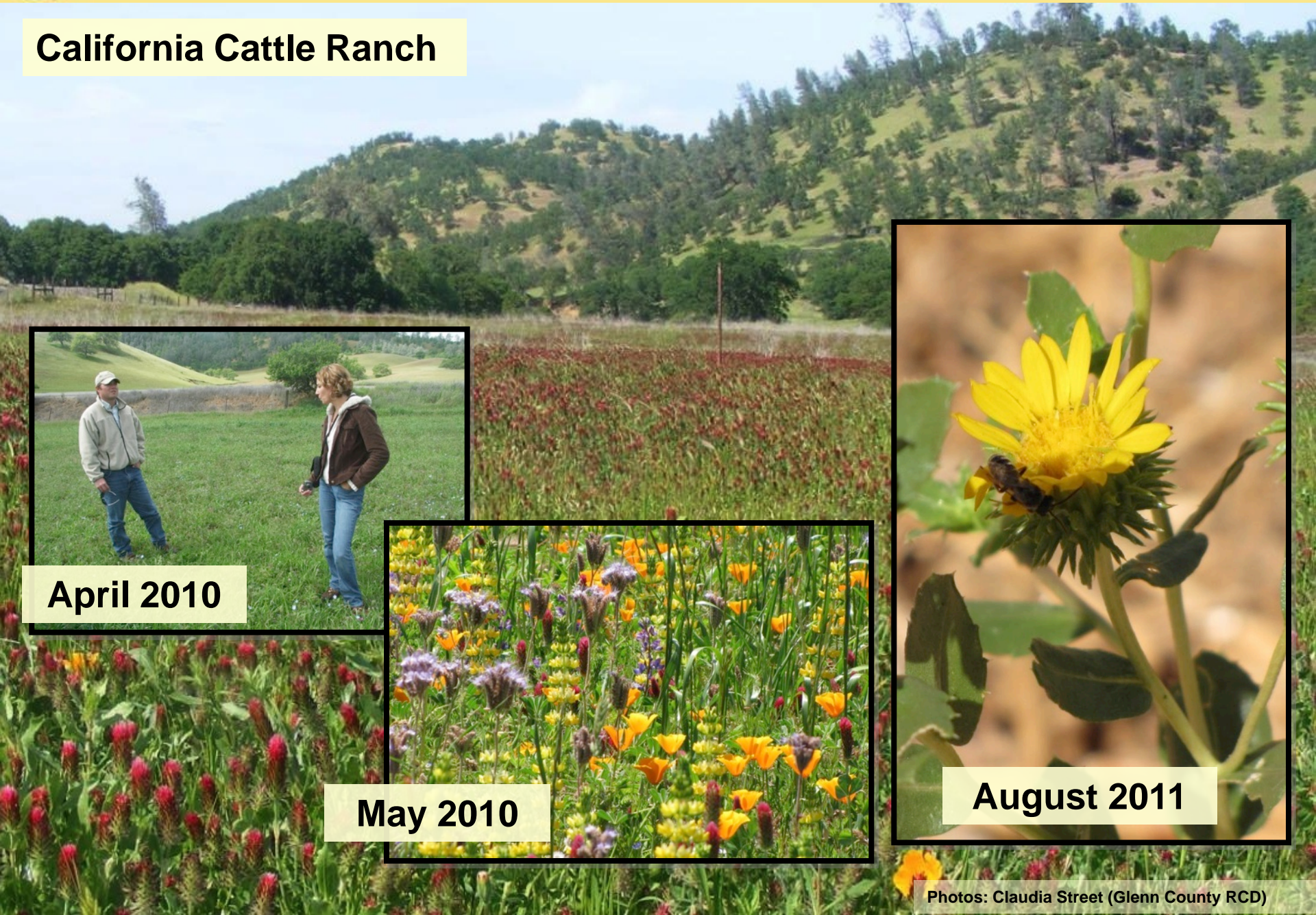


Oregon Cherry Orchard





California Cattle Ranch



April 2010



May 2010



August 2011



New Hampshire Blueberry Research Farm



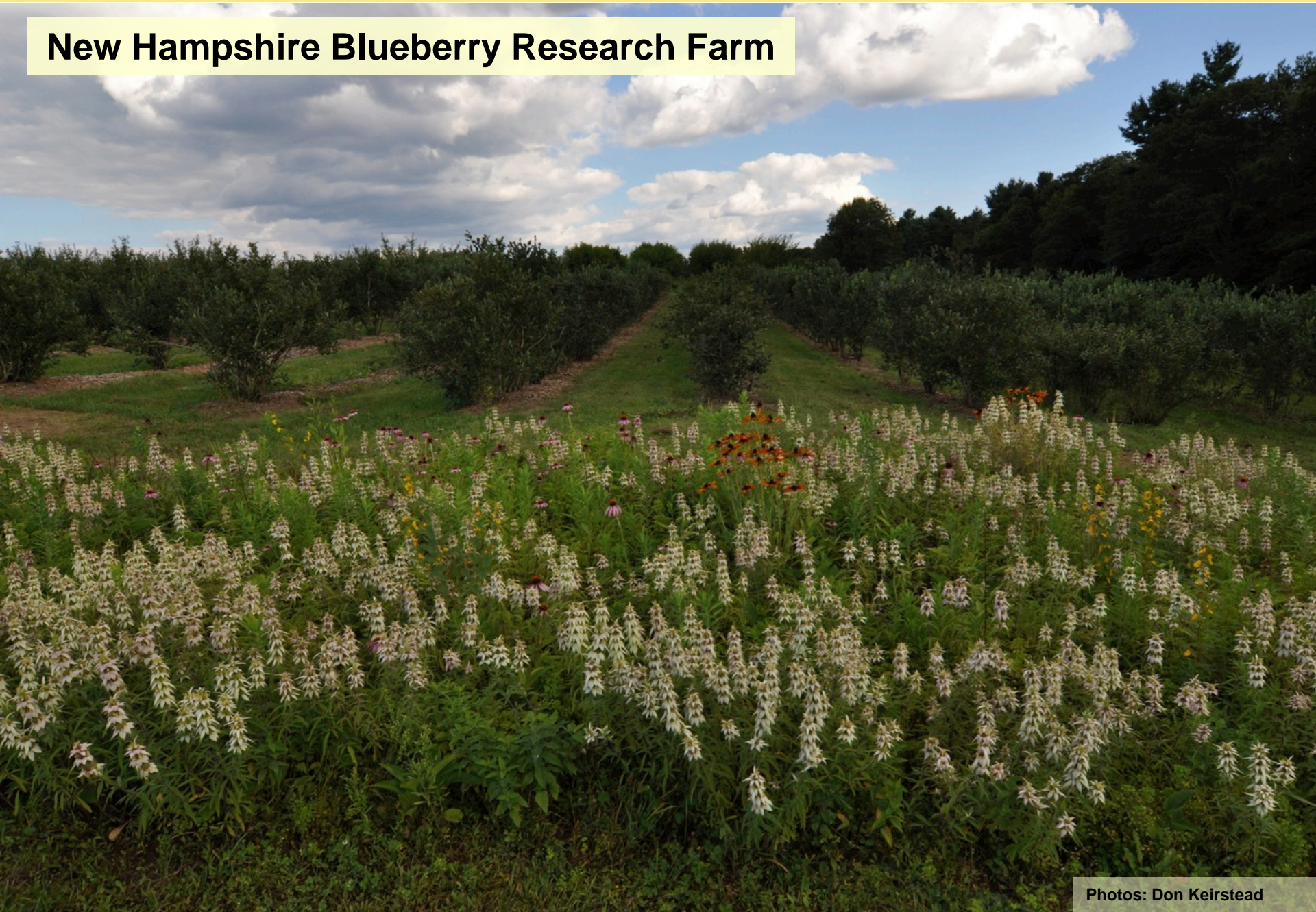
Pre-Planting: 2009



Post-Planting: 2011



New Hampshire Blueberry Research Farm





Oregon Pear and Hay Farm

Pre-Planting: Fall 2010

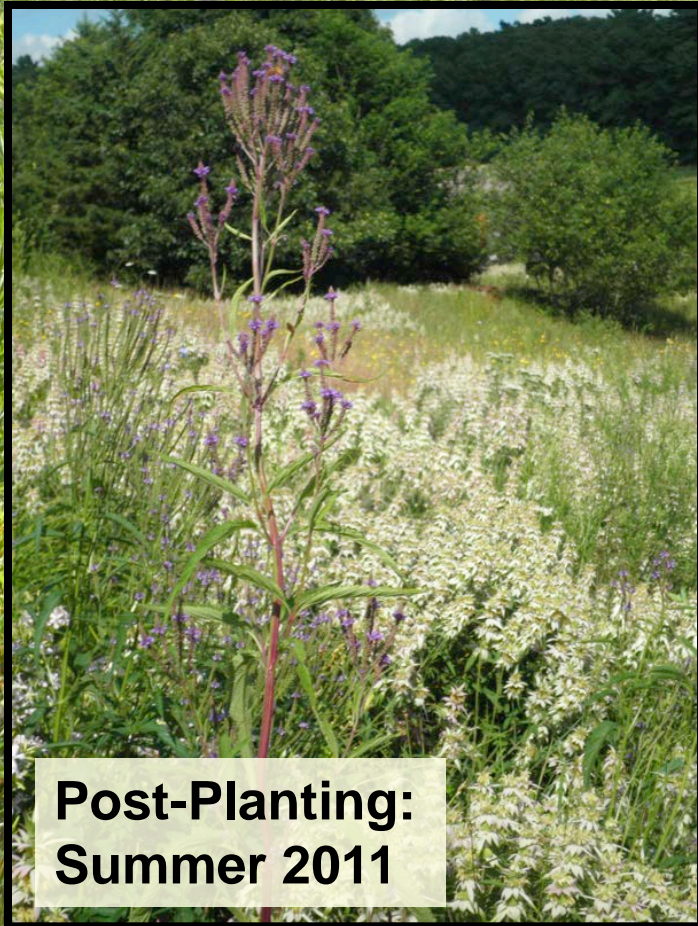


Post-Planting: Summer 2011





Massachusetts Cranberry Farm



**Post-Planting:
Summer 2011**



**Hydroseeding
Native Wild-
flowers:
Fall 2010**



Technical and Training Documents:

- Developed draft Conservation Cover and Hedgerow conservation practice standard job sheets and detailed pollinator habitat implementation guidelines for six regions of the U.S.

Hedgerow Planting for Pollinators in Southern California – Coast and Foothill Region
Practice Standard 422 Implementation Guide July 2012



Hedgerow Planting for Pollinators in Florida
Practice Standard 422 Implementation Guide July 2012



Conservation Cover for Pollinators in California
Practice Standard 327 Implementation Guide July 2012



PURPOSE
These instructions provide in-depth guidance on how to install nectar and pollen habitat for bees in the form of wildflower meadow plantings. To plan a specific project, use this guide with the Conservation Cover for Pollinators Job Sheet (included later in this document).

CLIENT CONSERVATION OBJECTIVES
Depending on landowner objectives and project design, pollinator habitat may also provide food and cover for other wildlife, reduce soil erosion, protect water quality, and attract other beneficial insects such as predators of crop pests.

KEY SITE CHARACTERISTICS
Site selection for pollinator habitat should take the following into consideration:

- **Pesticide Drift:** Habitat must be protected from pesticides (especially insecticides and bee-toxic fungicides). Only sites with no to very low risk for insecticide drift should be established as new habitat.
- **Accessibility:** New habitat should be accessible to equipment for planting and maintenance operations.
- **Sunlight:** Most wildflowers and native shrubs grow best in full sunlight.
- **Slope:** Steep or highly erodible sites should not be disturbed. For re-vegetating such sites, consider Critical Area Planting (342) or other suitable Practice Standards.

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Conservation Cover for Pollinators in New England
Practice Standard 327 Implementation Guide July 2012



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Hedgerow Planting for Pollinators in Western OR and WA
Practice Standard 422 Implementation Guide July 2012



PURPOSE
These instructions provide in-depth guidance on how to install nectar and pollen habitat for bees in the form of linear rows of native flowering shrubs. To plan a specific project, use this guide with the Hedgerow Planting for Pollinators in Western OR and WA Job Sheet.

CLIENT CONSERVATION OBJECTIVES
Depending on landowner objectives and project design, pollinator hedgerows may also provide food and cover for other wildlife, provide windbreaks, reduce soil erosion, protect water quality, and attract other beneficial insects such as predators of crop pests.

KEY SITE CHARACTERISTICS
Site selection for pollinator habitat should take the following into consideration:

- **Pesticide Drift:** Habitat must be protected from pesticides (especially insecticides and bee-toxic fungicides). Only sites with no to very low risk for insecticide drift should be established as new habitat.
- **Accessibility:** New habitat should be accessible for planting and maintenance operations.
- **Sunlight:** Most native shrubs grow best in full sunlight.
- **Slope:** For re-vegetating steep or highly erodible sites, consider Critical Area Planting (342) or other suitable Practice Standards.
- **Weed Pressure:** Areas with high weed pressure will take more time and effort to prepare for planting. It is also important to note the primary weed composition. Knowing the most abundant weed species on site and whether they are grass or broadleaf, perennial or annual, and woody or



Conservation Cover for Pollinators in New England

Practice Installation Job Sheet

July 2012

| | | | | |
|---------------------------------|----------|--------------|----|----|
| Client: | Farm #: | Total Acres: | | |
| Field(s): | Tract #: | S. | T. | R. |
| Planned By: | Date: | | | |
| Client Conservation Objectives: | | | | |

PURPOSE

This Practice Installation Job Sheet documents the process of establishing nectar and pollen habitat for bees in the form of wildflower meadow plantings. Other natural resources may also benefit, depending on your conservation objectives and the integration of this habitat with other conservation practices. Installation shall be in accordance with these requirements and any attached drawings. No changes are to be made without prior approval from the technical specialist who approved the installation plan.

For detailed instructions on each step this Job Sheet, please see the *Conservation Cover for Pollinators in New England Implementation Guide*.

KEY SITE CHARACTERISTICS

Risk of pesticide drift on site? Low to High Very Low to None

Weeds: weed pressure, and primary weed species of concern

Site history: historic and current plant cover, past use of land, pre-emergent herbicide use, compaction, etc.

Soils and habitat: soil texture (coarse to fine), drainage, and moisture level

Irrigation: availability and method (necessary if transplants are to be used)

Other concerns or conservation goals that may affect plant choice or site preparation and planting:

PLANT SELECTION: WILDFLOWER SEED MIX (Choose from the *Conservation Cover for Pollinators in New England Implementation Guide*)

Mesic Site Seed Mix Wetland Site Seed Mix



- Cranberry Site Seed Mix Custom or Low Cost Seed Mix

Note species substitutions here:

Note: Transplants may be preferred when seed is not available, weed pressure is high, or when a particular species is difficult to establish by seed. Transplanting can be most cost-effective when using plug plants. Conservation Cover can also include woody plants. See *Hedgerows for Pollinators in New England Job Sheet and Implementation Guide* for suggested plants.

Note any woody or herbaceous species established from transplants here:

SITE PREPARATION METHOD (Choose an option and note any adjustments):

- Herbicide Solarization

- Severe weed pressure? (If so, an additional year of site prep or the use of transplants should be considered. See the *Conservation Cover for Pollinators in New England Implementation Guide* for information on assessing weed pressure)

Adjustments:

PLANTING METHOD (Choose option(s) and note adjustments here):

- Broadcasting: by Machine or Hand Native Seed Drill
 Drop Seeding Transplants

Adjustments:

MAINTENANCE DURING ESTABLISHMENT (check all that potentially apply)

- | | |
|--|---|
| <input type="checkbox"/> Spot Spraying Weeds with Herbicide | <input type="checkbox"/> Hand Weeding and/or Hoeing |
| <input type="checkbox"/> Grass Specific or Other Selective Herbicide | <input type="checkbox"/> Other: _____ |
| <input type="checkbox"/> Managing Irrigation | <input type="checkbox"/> Other: _____ |
| <input type="checkbox"/> Mowing / String-Trimming | <input type="checkbox"/> Other: _____ |

LONG TERM SITE OPERATIONS AND MAINTENANCE

Control herbivores as needed, but remove plant guards or other materials that could impede plant growth as soon as possible after establishment.

In most cases, transplants can be removed from irrigation by the end of the second growing season after planting. Maintain the long-term plant diversity of pollinator habitat by re-seeding or re-planting as necessary.



Next Steps

- Customizing job sheets and restoration guides in collaboration with NRCS state offices.
 - Get in touch to be part of the process!
- Long-term operations and management guidance needs to be developed
- Replicated field trials of organic site preparation and weed abatement
- Work with Plant Materials Program and Native Seed Industry to assess additional plant species.
 - Inventory shortages are a problem!





Demonstration sites:

- Established more than 20 demonstration sites on farms across the United States



Additional Resources





Published in February 2011

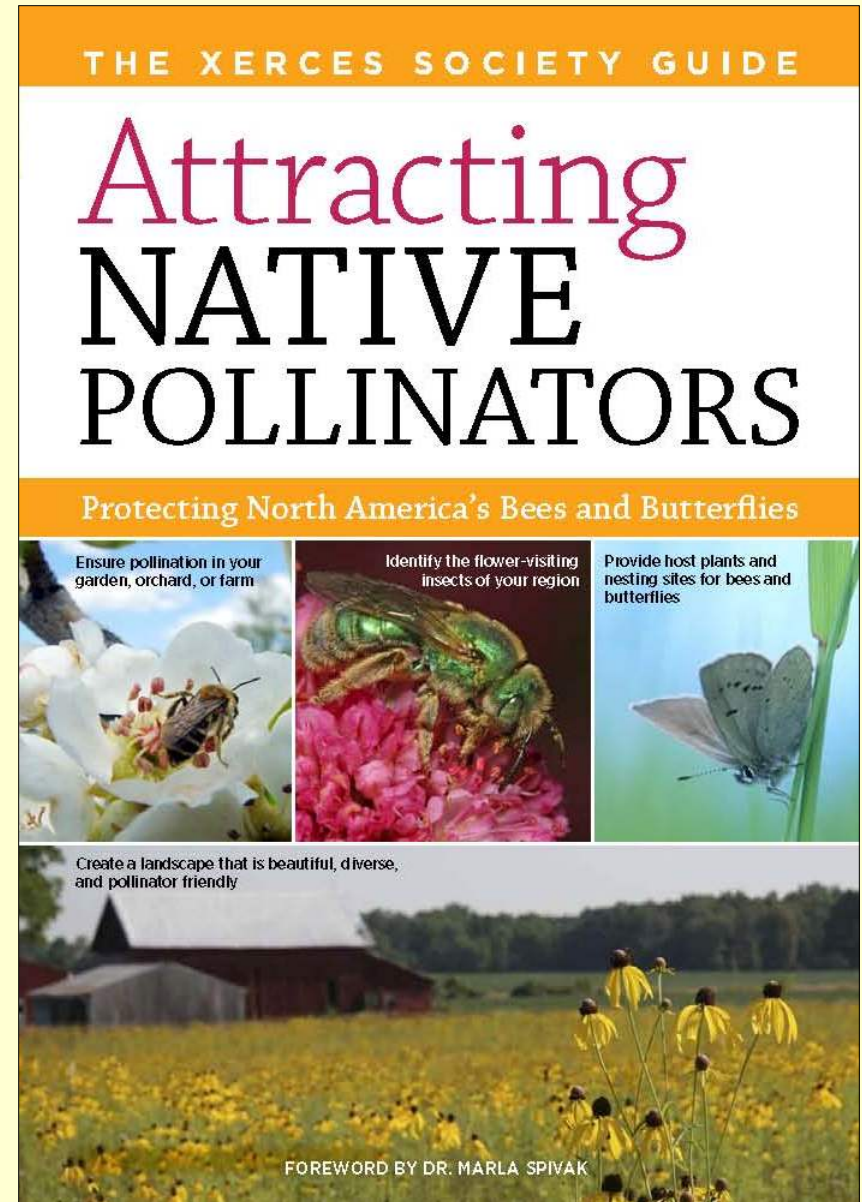
“*Attracting Native Pollinators* belongs on the bookshelf of everyone who values the future of the natural world.”

- Douglas W. Tallamy, researcher and author of *Bringing Nature Home*

“Precise, elegant and thoughtful, the recommendations offered by the Xerces Society will become essential to advancing a healthy and diverse food production system.”

- Gary Nabhan, author of *The Forgotten Pollinators* and *Renewing America's Food Traditions*

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Pollinator Conservation Resource Center

Region-specific Information from Xerces, Cooperative Extension, USDA-NRCS, NGO, and other sources, including:

- Regional plant lists
- National plant lists
- Conservation guides
- Nest construction guides
- Links to identification guides
- Pesticide guidelines
- Native plant nursery directory

www.xerces.org/pollinator-resource-center

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Pollinator Conservation Resource Center

Welcome to the Pollinator Conservation Resource Center, where you can find regional information about plant lists, habitat conservation guides, and more. Scroll over the map below and click on your region of the country. For questions or comments about the Resource Center, or to suggest additional content, please contact [Eric Medler](#), Xerces Assistant Pollinator Program Director.

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- [bumble bees in decline](#)
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Program Highlights

- [Online presentation](#) on pollinator conservation basics in farm landscape
- The Xerces Society works with congressional staff to include [pollinators in the Farm Bill](#)
- Xerces organizes a [Briefing to U.S. legislators](#) on honeybees, Colony Collapse Disorder and native pollinators
- The National Research Council issues a [report](#) on the Status of Pollinators in North America
- Agriculturally important [bumble bees in decline](#)

This resource center is a collaboration of the Xerces Society and [Neal Williams at the University of California, Davis](#). Significant funding was provided by a grant from NRESARE. Additional funding was provided by the USDA Natural Resources Conservation Service, the Columbia Foundation, Turner Foundation, Panta Rhea Foundation, Disney Wildlife Conservation Fund, CS Fund, Wildwood Foundation, CERES/Greater Milwaukee Foundation, Bullitt Foundation, Organic Valley, Organic Farming Research Foundation, The White Pine Fund/The Hawkaglen Foundation, and Xerces Society members.

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Please, contact us if you would like help planning or reviewing pollinator and beneficial insect projects.

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Holli Kuykendall and David Lamm
(East National Tech Support Center)
& Sarah Brown (West National Tech
Support Center and Oregon Tilth).

Major support from the West
National Tech Support Center and a
USDA-NRCS Conservation
Innovation Grant.

Financial support from

- Xerces Society Members
- NRCS Conservation Innovation Grant
- NRCS West Nat'l Technology Support Ctr.
- Turner Foundation
- CS Fund
- The Ceres Foundation
- Sarah K. de Coizart Article TENTH
Perpetual Charitable Trust.
- Dudley Foundation
- Bullitt Foundation
- Disney Worldwide Conservation Fund
- Gaia Fund

