



THE XERCES SOCIETY
FOR INVERTEBRATE CONSERVATION

Native Bee Conservation

Pollinator Habitat

Assessment Guide for Organic Farms



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The Xerces Society for
Invertebrate Conservation

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Pollinator Habitat Assessment for Organic Farms

Purpose

This tool is meant to help educate conservation planners and landowners, prioritize conservation actions, and quantify habitat or farm management improvements on a single farm. The goal of this tool is not to compare one farm with another. Rather, it is intended to help incorporate pollinator conservation into a whole farm plan and then document improvements in pollinator habitat resulting from specific actions and management practices. As with any tool of this nature, the evaluation and scoring practice can be a subjective process, and the usefulness of the tool is dependent upon the consistency of the evaluator. While the goal is to implement changes that will result in an increased final score, there may not always be a viable treatment for individual variables. The scoring goals outlined below in the instructions are general guidelines, but the capacity to reach or exceed these goals varies widely in different landscapes and may be refined by state NRCS offices for a more regionally specific pollinator habitat assessment guide.

Instructions

- This pollinator habitat assessment guide can be used in both orchard and field crop settings.
- The accompanying photos and notes will help you identify and assess some specific habitat features.
- An assessment should be done twice, once during the conservation planning process (before project implementation) and once after the plan has been implemented.
- Prior to conducting an assessment, print out aerial photos to help with site and landscape questions.
- Each item in the assessment should be given a score of 0 (not present) or the appropriate value from the “Score” column.
- Add up the scores to calculate a subtotal for each subsection (e.g., 4a. Sites for ground-nesting bees).
- In addition, add up subsection subtotals to get a total for each section. Transfer these figures into the summary table on page 3 to generate the overall score for each assessment.
- The post-implementation goal is hard to define for the country as a whole. Ideally, landowners should strive to achieve an overall score of at least 100, and an improvement of at least 40 points. If this is not possible for your region or cropping system, talk to your area biologist or planner for guidance.

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The Xerces Society is a nonprofit organization that protects wildlife through the conservation of invertebrates and their habitat. Established in 1971, the Society is at the forefront of invertebrate protection worldwide.

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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.

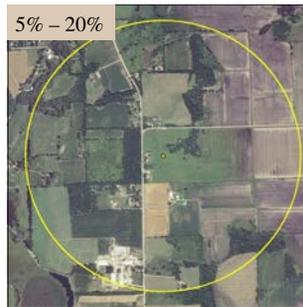
	Before	After
Section 1: Landscape Features (max score 20)		
Section 2: Farmscape Features (max score 35)		
Section 3: Foraging Habitat (max score 40)		
Section 4: Nesting Habitat (max score 38)		
Section 5: Farm Practices (max score 85)		
OVERALL SCORE		

Section 1: Landscape Features

1a. Percent of natural or semi-natural vegetation within 1/2 mile of project area (whether on or off farm). This land use cover includes, prairie, chaparral, woodlands or grasslands, riparian habitat and wetlands, suburban wooded areas, non-invasive weedy areas. It does NOT include lawn grass.

The photos below illustrate the different percent covers.

SELECT ONLY ONE	Score	Before	After	Treatment to increase score (no treatment if off farm)
>30%	10			
20% – 30%	7			
5% – 20%	3			
< 5%	0			
<i>Subtotal (1a)</i>				



1b. Dominant vegetation in non-cropped area within 1/2 mile of project area (whether on or off farm).

SELECT ONLY ONE	Score	Before	After	Treatment to increase score (no treatment if off farm)
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 (1b)</i>				

Landscape Features Total

(1a + 1b)

Section 2

2a. Percentage of farm that is in natural or semi-natural habitat (see 1a for examples)

SELECT ONLY ONE	Score	Before	After	Treatment to increase score
10% or more	10			
6% – 9%	7			
3% – 5%	5			
1% – 2%	3			
0%	0			
<i>Subtotal (2a)</i>				

Go to top of page 5

Section 2: Farmscape Features

2b. Additional farmscape features.				
SCORE ALL OPTIONS THAT APPLY	Score	Before	After	Treatment to increase score
Permanent meadows with diverse wildflowers	5			
Buffers: 1 point for every 20% of area within 25 feet of water features (e.g. stream, irrigation ditch, pond, etc.) that is vegetated	0 - 5			
Hedgerows, windbreaks, or fencerows of diverse tree/shrub species	5			
Annual flowering cover crops, annual bee pasture, bolting crops	5			
Source of clean surface water (non-contaminated)	5			
<i>Subtotal (2b)</i>				
Farmscape Features Total				(2a + 2b)

Section 3: Foraging Habitat

3a. Percentage of vegetative cover (non-crop area) that is forbs or flowering shrubs on farm.				
<i>The photos below illustrate some categories. See regional technical notes (listed on page 8) for lists of preferred pollinator plants and other information.</i>				
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			
<i>Subtotal (3a)</i>				



3b. Number of species of forbs and flowering shrubs on farm that bloom in <u>spring</u> and support bees. This includes some crops and cover crops (see appendix for examples).				
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 (3b)</i>				

Section 3: Foraging Habitat (cont.)

3c. Number of species of forbs and flowering shrubs on farm that bloom in summer and support bees. This includes some crops and cover crops (see appendix for examples).

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 (3c)</i>				

3d. Number of species of forbs and flowering shrubs on farm that bloom in fall and support bees. This includes some crops and cover crops (see appendix for examples).

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 (3d)</i>				

Foraging Habitat Total

$(3a + 3b + 3c + 3d)$

Section 4: Native Bee Nesting Habitat

4a. 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, including at the base of crop plants such as squash. 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, S = scarce	Score	Before	After	Treatment to increase score
Areas of well-drained bare ground, or with sparse vegetation	A = 5 M = 3 S = 1			
Areas with sandy to sandy loam soil	A = 5 M = 3 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 (absent = 0, present = 3)	3			
<i>Subtotal (4a)</i>				



Section 4: Native Bee Nesting Habitat (cont.)

4b. 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 = 5 M = 3 S = 1			
Pithy twigs (elderberry, cane fruit, sumac, etc.)	A = 5 M = 3 S = 1			
Areas of undisturbed native bunch grasses (clump-forming)	A = 5 M = 3 S = 1			
<i>Subtotal (1b)</i>				



Native Bee Nesting Habitat Total

← (4a + 4b)

Section 5: Farm Practices

5a. 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			
IPM program in place that specifically addresses pollinator protection	5			
Insecticides sprayed at night	5			
Insecticides sprayed only outside of crop bloom period	5			
Buffer of at least 30' between any insecticide application and habitat areas	5			
Spray drift carefully controlled	5			
Annual calibration of spray equipment	5			
<i>Subtotal (5a)</i>				

5b. Land management techniques on the farm or in project area

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 disturbance or cultivation of field borders	10			
<i>Subtotal (5b)</i>				

Farm Practices Total

← (5a + 5b)

Habitat Assessment Reference Materials

Pacific Northwest

Plants for Pollinators in the Inland Northwest (Pullman PMC Technical Note)

http://www.xerces.org/wp-content/uploads/2011/02/nrcstechnote_plantsinlandnw1.pdf

California

Pollinator Biology and Habitat in California (NRCS Technical Note)

ftp://ftp-fc.sc.egov.usda.gov/CA/technical/technotes/TN_Biology_19_Pollinator_Biology_CA_5-09.pdf

Plants for Pollinators in Oregon (NRCS Technical Note)

http://plants.usda.gov/pollinators/Plants_for_Pollinators_in_Oregon_PM%2013.pdf

Southwest and South Central Regions

Pollinator Plants for Texas Conservation Practices (NRCS Technical Note)

<http://www.plant-materials.nrcs.usda.gov/pubs/txpmctn8222.pdf>

Mountain Region

Plants for Pollinators in the Intermountain West (Aberdeen PMC Technical Note)

http://www.xerces.org/wp-content/uploads/2011/02/nrcstechnote_plantsintermtwest.pdf

Pollinator Biology and Habitat (Colorado NRCS Technical Note)

<http://efotg.nrcs.usda.gov/references/public/CO/pollinators.pdf>

Habitat Development for Pollinator Insects (Montana NRCS Technical Note)

http://plants.usda.gov/pollinators/Habitat_Development_for_Pollinator_Insects_MT-20.pdf

North Central States

Pollinators (South Dakota NRCS Fact Sheet)

http://plants.usda.gov/pollinators/Pollinators_South_Dakota_Fact_Sheet_SD-FS-55.pdf

Great Lakes States

Wisconsin Pollinator Biology and Habitat (NRCS Technical Note)

<ftp://ftp-fc.sc.egov.usda.gov/WI/technotes/biology-tn8.pdf>

Illinois Pollinator Biology and Habitat (NRCS Technical Note)

<http://efotg.nrcs.usda.gov/references/public/IL/BTechNote23.pdf>

Northeast Region

New England Pollinator Biology and Habitat (NRCS Technical Note)

ftp://ftp-fc.sc.egov.usda.gov/NH/WWW/Technical/New_England_NRCS_Pollinator_Tech_Note_FINAL.pdf

Mid Atlantic States

Delaware Native Plants for Native Bees (NRCS and Delaware Department of Agriculture Technical Bulletin)

<http://dda.delaware.gov/plantind/forms/publications/Delaware%20Native%20Plants%20for%20Native%20Bees.pdf>

Habitat Development for Pollinators in New Jersey (NRCS Technical Note)

http://plants.usda.gov/pollinators/Habitat_Development_for_Pollinators_NJ.pdf

Wildflower Meadows for Wildlife and Pollinators (Virginia NRCS Job Sheet)

http://plants.usda.gov/pollinators/Conservation_Cover_Wildflower_Meadow_for_Wildlife_and_Pollinators_327a.pdf

Southeast Region

Alabama Conservation Security Program: Wildlife Enhancement Activity, Pollinator Areas (NRCS Job Sheet)

http://plants.usda.gov/pollinators/CSP_Wildlife_Enhancement_Activity-Pollinator_Areas.pdf

Program and Practice Standard Guidance for Pollinator Conservation

Using Farm Bill Programs for Pollinator Conservation (NRCS Technical Note): Guidelines on how EQIP, CSP, and other programs can be used to restore or enhance habitat for pollinators.

<http://www.xerces.org/wp-content/uploads/2009/04/using-farmbill-programs-for-pollinator-conservation.pdf>

Farm Management Guidelines for Pollinator Conservation

Farming for Bees (Xerces Society Conservation Guidelines): A guide to adapting farm practices to conserve native crop pollinators and their habitat.

http://www.xerces.org/wp-content/uploads/2008/11/farming_for_bees_guidelines_xerces_society.pdf

Pesticide Considerations for Native Bees in Agroforestry (USDA National Agroforestry Center Technical Note): An article highlighting how to reduce bee poisoning from pesticides.

<http://www.xerces.org/wp-content/uploads/2008/10/agroforestrynotes35-pesticides.pdf>

How to Reduce Bee Poisoning from Pesticides (Oregon State University Extension Fact Sheet): A publication listing common agricultural pesticides and their known effects on multiple bee species.

<http://extension.oregonstate.edu/catalog/pdf/pnw/pnw591.pdf>

Supplementing Native Bee Nest Sites

Managing Alternative Pollinators: A Handbook for Beekeepers, Growers, and Conservationists (Sustainable Agriculture Research and Education Program Handbook): A full color guide to providing nests sites for bumblebees, mason bees, leafcutter bees, alkali bees, and other native species.

<http://www.sare.org/publications/pollinators/pollinators.pdf>

Tunnel Nest Construction and Management (Xerces Society Fact Sheet): Guidelines on the construction and maintenance of nests for tunnel nesting native bees.

<http://www.xerces.org/wp-content/uploads/2009/11/tunnel-nest-management-xerces-society.pdf>

Crops and cover crops that provide pollen and/or nectar resources for bees (This list is not exhaustive):

Alfalfa, almonds, alyssum, apples, avocados, apricots, blueberries, buckwheat, canola, cherries, citrus, clover, corn, cotton, cran-berries, cucumber, eggplant, fava beans, macadamia nuts, melons, mustard, peaches, pears, peas, peppers, phacelia, plums, pumpkins, raspberries, soybean, squash, strawberries, sunflower, tomatoes, vegetable seed, vetch, and watermelon.