



THE XERCES SOCIETY  
FOR INVERTEBRATE CONSERVATION

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Native Bee Conservation

# Pollinator Habitat Assessment Form and Guide



June 2011

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The Xerces Society for  
Invertebrate Conservation

[www.xerces.org](http://www.xerces.org)

*Modified for use in Maine  
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Biologist*

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## Instructions

*The index value produced through this spreadsheet focuses especially on native bee conservation. Many of the practices are expected to improve habitat for honeybees and other beneficial insects also. Hummingbirds and other birds should benefit as well.*

- This habitat assessment 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 before project implementation and once after.
- 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.
- **This form, if filled electronically, will automatically calculate section subtotals, totals, and before and after grand totals in the summary on page 3. Hard copies filled out by hand will require manual calculation as follows.**
- Add up the scores to calculate a subtotal for each subsection (e.g., 1a. 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 main purpose of this worksheet is to provide a way to evaluate habitat and measure changes over time, and to help inspire the landowners or growers to take additional steps to assure the presence of sufficient habitat. A post-implementation goal is an overall score of at least 110 and an improvement of at least 40 points is laudable.**

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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: Native Bee Nesting Habitat		
Section 2: Foraging Habitat & Landscape Features		
Section 3: Farm Practices		
<b>OVERALL SCORE</b>		

**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, S = scarce	Score	Before	After	Treatment to increase score
Areas of well-drained bare ground, or with sparse vegetation	A = 10 M = 5 S = 1			
Areas with sandy to sandy loam soil, mostly non-vegetated.	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 (absent = 0, present = 1)	0 – 3			
<i>Subtotal (1a)</i>				



**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 such as raspberries and blackberries, sumac, etc.)	A = 10 M = 5 S = 1			
Overgrown native bunch grasses (clump-forming) present (absent = 0, present = 3)	0 – 3			
<i>Subtotal (1b)</i>				



Section 1 (cont.)

**1c. Supplementary wood- and cavity-nesting sites**

Wood- or cavity-nesting bees readily occupy artificial nests. Nest blocks should be obvious, and ideally placed near a large visual landmark such as a building. Nest hygiene is an important consideration. For optimum pollinator populations, blocks should be cleaned, maintained, and periodically replaced.

SCORE ALL OPTIONS THAT APPLY	Score	Before	After	Treatment to increase score
Nest blocks: 1 point (10 max) for every block in the field (at least 50 feet between blocks)	0 – 10			
Nest blocks with no more than 20 holes per block	5			
Nest blocks regularly cleaned or replaced	5			
Nest blocks placed near large visual landmarks	3			
<i>Subtotal (1c)</i>				
<b>Nesting Habitat Total</b>				

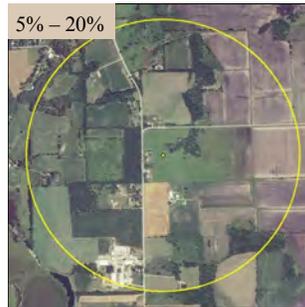
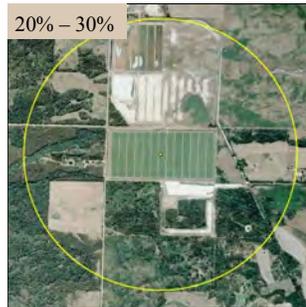
(1a + 1b + 1c)

Section 2: Foraging Habitat & Landscape Features

**2a. Percent of natural vegetation within 1/2 mile of site**

Using an aerial photo draw a 0.5 mile radius circle around the site. "Natural vegetation" is a *matrix* of forest, wet meadow, swamp, rocky balds, shrubland, lowbush blueberry fields, etc. Monocultures of any habitat (e.g. forest) should receive a score of 0. Do not count water bodies, roads, parking lots, residential or business development, row crops, orchards, active pasture, and farm headquarters. Photos below illustrate these different categories.

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



**2b. Dominant vegetation relevant to pollinators in non-cropped areas within an operation's boundaries**

Inventory by a conservationist will be helpful to quantify vegetation. A complete plant list for the site is not necessary, but careful consideration of the dominant plants is necessary. Areas dominated by a regularly mowed lawn or intensively grazed will have fewer forage plants for pollinators.

SELECT ONLY ONE	Score	Before	After	Treatment to increase score
Pollen & nectar producing 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>				

Section 2: Foraging Habitat & Landscape Features (cont.)

**2c. Percent of non-invasive vegetative cover (non-crop area) in forbs or flowering shrubs within 1/2 mile**

Select forage plants will ideally provide a continuous abundance of flowers through the entire growing season. The photos below illustrate some categories. See regional technical notes and ME NRCS' Conservation Cover Pollinator Job Sheet (listed on page 8) for more 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			
<i>Subtotal (2c)</i>				



**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>				

**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			
<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>				

Continue here

Sect. 2: (cont.)

<b>2g. Size of average fields (not FSA-designated fields, but contiguous acres of crop or pastureland)</b>				
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 (2g)</i>				
<b>Habitat &amp; Landscape Total</b>				

$(2a + 2b + 2c + 2d + 2e + 2f + 2g)$

Section 3: Farm Practices

<b>3a. Pest and disease control practices on the farm</b>				
Bees are highly susceptible to synthetic insecticides and may be adversely impacted by herbicides and fungicides. With all pesticide applications, even organic approved chemicals, take care to apply when needed and when bees are not foraging (i.e., at night). Even low doses of systemic pesticides including neonicotinoids, which could be in plants grown from treated seed, can have detrimental effects on honeybees and native bees.				
SELECT ONLY ONE	Score	Before	After	Treatment to increase score
No use of pesticides	40			
Active Integrated Pest Management (IPM) program in place and only organic approved chemicals used	20			
No IPM program and only organic approved chemicals are used	10			
IPM program in place and both organic and non-organic pesticides are routinely used	5			
No IPM program and non-organic pesticides are routinely used	0			
<i>Subtotal (3a)</i>				
<b>3b. Land management techniques</b>				
SCORE ALL OPTIONS THAT APPLY	Score	Before	After	Treatment to increase score
No-till or minimum till practices are routinely used on the operation	20			
Burning, mowing, or haying is done to < 1/3 of agricultural fields each year.	10			
1/4 of ag fields have herbaceous field borders with a diversity of wildflowers	10			
30–50 ft feathered forest edges are created and maintained on 1/4 of ag fields	10			
<i>Subtotal (3b)</i>				
<b>Farm Practices Total</b>				

$(3a + 3b)$

### Nectar and/or Pollen Producing Plants

Flowers near residences, field margins, pollinator strips, roadsides, out areas, and edge habitats can provide important forage resources for pollinators. Forage plantings will ideally provide a continuous supply of flowers through the entire growing season. Examples of some cultivated native shrubs and perennial forbs and additional easy to grow introduced non-invasive plants are listed below by flowering period. This is just a sample of potential bee friendly plants that grow well in Maine; these suggestions are based on observations of A. C. Dibble and others.

Early Flowering	Early Mid-season Flowering	Later Mid-season Flowering	Late Flowering
Smooth Penstemon ( <i>Penstemon digitalis</i> )	American Basswood ( <i>Tilia americana</i> )	Bee Balm ( <i>Monarda didyma</i> )	Lance-leaved Coreopsis ( <i>Coreopsis lanceolata</i> )
Eastern Columbine ( <i>Aquilegia canadensis</i> )	Wild Bergamot ( <i>Monarda fistulosa</i> )	Boneset ( <i>Eupatorium perfoliatum</i> )	Maximilian's Sunflower ( <i>Helianthus maximiliani</i> )
Canadian Fly Honeysuckle ( <i>Lonicera canadensis</i> )	Virginia Mountain Mint ( <i>Pycnanthemum virginianum</i> )	Cosmos ( <i>Cosmos bipinnatus</i> )	Heath Aster ( <i>Symphotrichum ericoides</i> )
Cherry: Black ( <i>Prunus serotina</i> ), Pin ( <i>P. pennsylvanica</i> ), Choke ( <i>P. virginiana</i> )	Common Milkweed ( <i>Asclepias syriaca</i> )	Globe Thistle ( <i>Echinops exaltata</i> )	Black-eyed Susan ( <i>Rudbeckia hirta</i> )
Crocus ( <i>Crocus spp.</i> ), early flowering	Butterfly Milkweed ( <i>Asclepias tuberosa</i> )	Lamb's Ears ( <i>Stachys lanata</i> )	Arrow-leaved Aster ( <i>Aster sagittifolius</i> )
Germander Speedwell ( <i>Veronica chamaedrys</i> )	Golden Alexander ( <i>Zizia aurea</i> )	Meadowsweet ( <i>Spiraea alba var. latifolia</i> )	New England Aster ( <i>Symphotrichum novae-angliae</i> )
Italian Bugloss ( <i>Anchusa azurea</i> )	Wild Golden Glow ( <i>Rudbeckia laciniata</i> )	Steeplebush ( <i>Spiraea tomentosa</i> )	New York Aster ( <i>Symphotrichum novae-belgii</i> )
Northern Blue Violet ( <i>Viola soraria</i> )	Blazing Star ( <i>Liatris scariosa</i> )	Purple Coneflower ( <i>Echinacea purpurea</i> )	Meadow Bottle Gentian ( <i>Gentiana clausa</i> )
Northern Fly Honeysuckle ( <i>Diervilla lonicera</i> )	Borage ( <i>Borago officinalis</i> )	Buckwheat ( <i>Fagopyrum esculentum</i> )	Swamp Milkweed ( <i>Asclepias incarnata</i> )
Red Maple ( <i>Acer rubrum</i> )	Thyme ( <i>Thymus spp.</i> )	Little Bluestem (* <i>Schizachyrium scoparium</i> )	Joe Pye Weed ( <i>Eupatorium maculatum</i> )
Shadbush ( <i>Amelanchier spp.</i> )	Oregano ( <i>Origanum vulgatum</i> )	* potential bumblebee nesting habitat, not a floral resource	Sneezeweed ( <i>Helenium autumnale</i> )
Trailing arbutus ( <i>Epigaea repens</i> )	Pasture Rose ( <i>Rosa carolina</i> )		Goldenrod ( <i>Solidago spp.</i> )
Willow ( <i>Salix spp.</i> )	Staghorn Sumac ( <i>Rhus typhina</i> )		Blue Lobelia ( <i>Lobelia siphilitica</i> )
Alfalfa ( <i>Medicago sativa</i> )	Black Huckleberry ( <i>Gaylussacia baccata</i> )		Tall Red Clover ( <i>Trifolium pratense</i> )
Crimson Clover ( <i>Trifolium incarnatum</i> )	Rhodora ( <i>Rhododendron canadensis</i> )		Sweet Pepperbush ( <i>Clethra alnifolia</i> )
Asike Clover ( <i>Trifolium hybridum</i> )	Perennial Blue Flax ( <i>Linum lewisii</i> )		Blanket Flower ( <i>Gaillardia aristata</i> )
Canola ( <i>Brassica napus</i> )	White Clover ( <i>Trifolium repens</i> )		

# Useful References

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## **Maine NRCS Pollinator Habitat Development Job Sheet**

[http://efotg.sc.egov.usda.gov/references/public/ME/ME\\_Pollinator\\_JS\\_new3.pdf](http://efotg.sc.egov.usda.gov/references/public/ME/ME_Pollinator_JS_new3.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](ftp://ftp-fc.sc.egov.usda.gov/NH/WWW/Technical/New_England_NRCS_Pollinator_Tech_Note_FINAL.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](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>

## **The Xerces Society Seed Calculator**

[http://efotg.sc.egov.usda.gov/references/public/ME/XERCES\\_SEED\\_MIX\\_CALCULATOR1.xlsx](http://efotg.sc.egov.usda.gov/references/public/ME/XERCES_SEED_MIX_CALCULATOR1.xlsx)

## **Maine Cooperative Extension**

<http://extension.umaine.edu/>

## **USDA PLANTS Database**

<http://plants.usda.gov/java/>

## **Newcomb's Wildflower Guide**

Newcomb, L. 1977. Little, Brown and Company. NY. 490 pp.

## **The Plants of Acadia National Park**

Mittelhauser, G, L.L. Gregory, S.C. Rooney, and J. E. Weber. 2010. The University of Maine Press, Orono, ME. 530 pp.

## **GoBotany (National Science Foundation and The NE Wildlife Society)**

<https://gobotany.newenglandwild.org/>

## **New England Flora**

Haines, A. D. (2011). *Flora Nova Angliae* (Plants of New England). Yale University Press and The New England Wildflower Society. 973pp.