

A close-up photograph of a bumblebee on a pink clover flower. In the foreground, a purple clover flower is visible. The background is a soft-focus green field. A semi-transparent green banner with a fine grid pattern is overlaid on the image, containing the title and author information.

Pollinator Habitat Conservation/Mgt.

TOBY ALEXANDER

USDA NATURAL RESOURCES CONSERVATION SERVICE

Pollinator Habitat

- ▶ Declines in honey bee and native bees
- ▶ Native bees can help with pollination services and improve productivity
- ▶ Key to local Pollinator Conservation
 - ▶ High quality foraging areas – Flowers: Pollen and Nectar
 - ▶ Nesting Sites – Ground, Tunnel, Cavities
 - ▶ Eliminate/alter Pesticide use to protect pollinators
- ▶ IMPORTANT – Recognize value of natural habitat around the Vermont landscape



Where to start?

- ▶ Is there a general interest in habitat or need for pollination services (e.g. fruits/veggies)?
- ▶ Are there other resource concerns on the farm to address?
- ▶ Opportunities for multi-species habitat management?
- ▶ Is there land available for active management for field borders, buffers, whole field management?



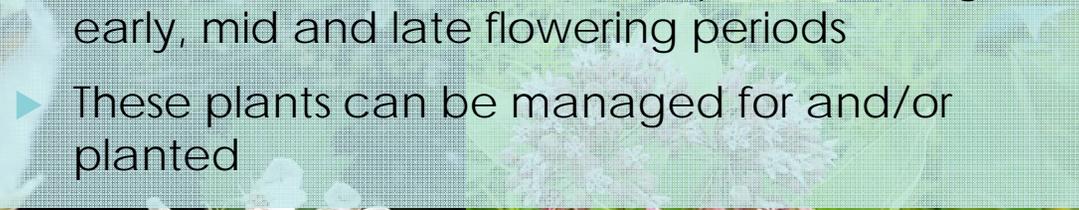
Inventory

- ▶ What is surrounding land - Forest, agriculture, open or idle land, suburban, or mix?
- ▶ Walk the land
 - ▶ Are there valuable pollinator plants in these cover types available through growing season?
 - ▶ Forage crops, forests, fields
 - ▶ Are there nesting sites available?
 - ▶ Various stages/ages of growth?
 - ▶ Pay attention to margins of fields/forests



Foraging – Early, Mid and Late Season

- ▶ Plant inventories can provide a picture of foraging sources through the season (or lack)
- ▶ Learn to recognize and encourage those high value species
- ▶ Goal is to have a number of species during early, mid and late flowering periods
- ▶ These plants can be managed for and/or planted



Foraging – Early Season Plants of Value



Mid Season Plants of Value



Late Season Plants of Value



Nesting – Wood

Wood tunnel nesting bees need snags, brush piles and trees/shrubs with hollow stems, such as elderberry, blackberry, and sumac



Nesting – Ground



Ground nesting native bees need access to the soil

Photos: Mace Vaughan, Matthew Shepherd

Planning Habitat for Pollinators

- ▶ Keep pollinators foraging and nesting in mind with each activity or management on the farm
- ▶ Create, maintain, improve idle areas, field/forest edges, natural areas (forage and nesting)
- ▶ Maintain and improve valuable forbs, shrubs and trees in and around the farm – fill in gaps in flowering periods
- ▶ USDA has funding assistance for Conservation Practices....



Grass Based Agriculture – Hay/Pasture

2007 frost seeding on applied
EQIP grazing contract land.

- ▶ Plantings - addition of legumes, re-seed, frost seed
- ▶ Maintaining idle areas within or nearby including snags, shrubs and beneficial forbs

Field Borders



Field borders can provide foraging and/or nesting sites – planted or idle

Hedgerows



- ▶ Hedgerows can support wood tunnel nesting bees and bumble bees
- ▶ Can be maintained or planted

Orchards, Fruits, Vegetables



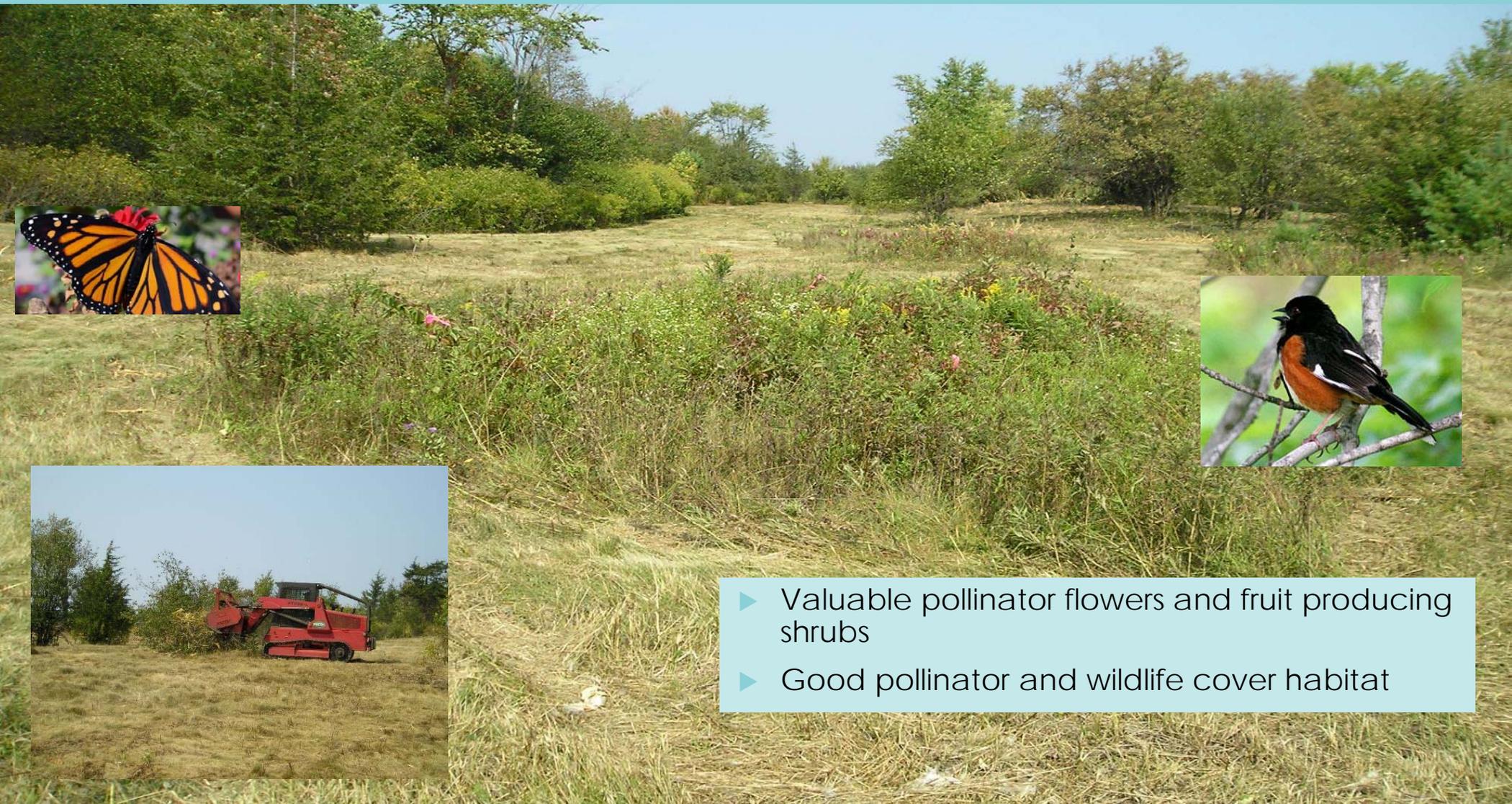
- ▶ Maintain/plant idle areas for valuable forage/nesting habitat
- ▶ Understory ground plantings (e.g. legumes)
- ▶ Longer term cover crops – flowering, allow bolt

Buffers and Tree/Shrub Planting



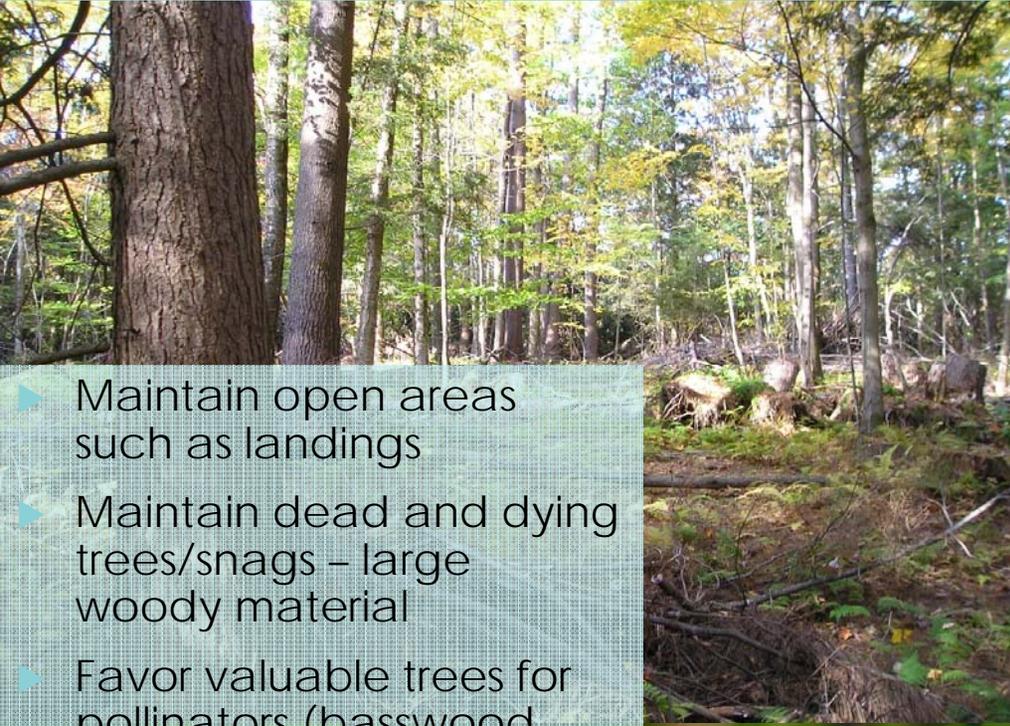
- ▶ Wetlands, Riparian Areas, Old Fields
 - ▶ Simplified vegetative community (reed canary grass)
 - ▶ Reduce disturbance
 - ▶ Plantings or natural regen

Early Successional Habitats

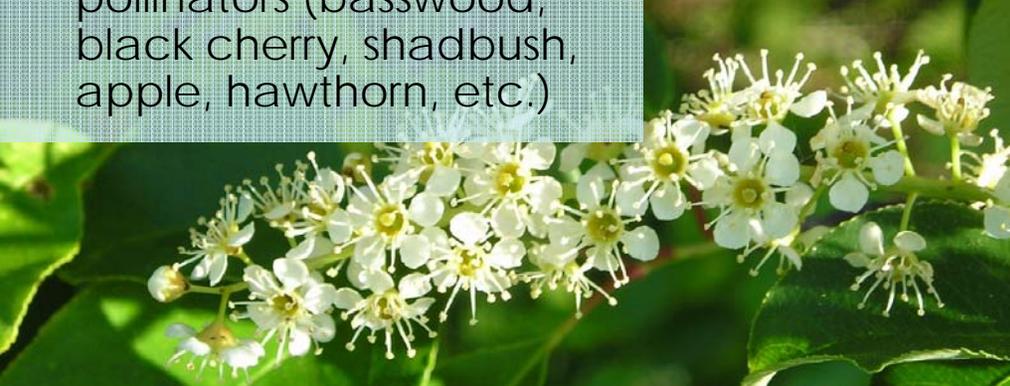


- ▶ Valuable pollinator flowers and fruit producing shrubs
- ▶ Good pollinator and wildlife cover habitat

Forestry



- ▶ Maintain open areas such as landings
- ▶ Maintain dead and dying trees/snags – large woody material
- ▶ Favor valuable trees for pollinators (basswood, black cherry, shadbush, apple, hawthorn, etc.)



Planting



- ▶ Vermont has good natural and semi natural habitats - plantings can supplement
- ▶ Garden plants, to field scale or field edge.
- ▶ PLAN ahead – do your homework
 - ▶ Seed costs can be quite high
 - ▶ Pick the right species/mix
 - ▶ Site prep is CRITICAL

Pollinator-Friendly Plants for the Northeast United States

NRCS Plant Materials Center

- ▶ Evaluated many species of wildflowers for the Northeast shown to be beneficial to pollinators
- ▶ Developed good information about ease of establishment and persistence
- ▶ Commercially available

for more information on pollinators and outreach, please [click here](#)



Planting Resources – Installation Guide



THE XERCES SOCIETY
FOR INVERTEBRATE CONSERVATION



Natural Resources Conservation Service



United States Department of Agriculture

Conservation Cover (327) for Pollinators in

New England Job Sheet Installation Guide



Photo: New Hampshire NRCS

October 2012

The Xerces Society for
Invertebrate Conservation

www.xerces.org

Appendix: Seed Mixes, Plant Lists and Sources, and References

Sample Seed Mixes

The following sample seed mixes are formulated for a 1-acre planting area. For larger areas, increase the rate accordingly. To create custom seed mixes, see recommended species master list on page 14 and the references section for a downloadable seed mix calculator.

Mesic Site Pollinator Seed Mix (Apple Orchards, Pumpkins, and Blueberry Farms)

The mix is designed to provide season-long pollen and nectar resources on any sunny mesic to slightly dry upland site.

COMMON NAME	SCIENTIFIC NAME	% OF MIX	SEEDS / FT ²	LBS / ACRE	PRICE / LB	TOTAL PRICE	BLOOM TIME
Golden Alexanders	<i>Zizia aurea</i>	3.0%	1.8	0.41	\$150	\$61.26	spring
Wild Lupine	<i>Lupinus perennis</i>	0.3%	0.18	0.49	\$200	\$98.01	spring
Wild Blue Indigo	<i>Baptisia australis</i>	0.2%	0.12	0.20	\$180	\$36.75	spring
Smooth Penstemon	<i>Penstemon digitalis</i>	10.0%	6	0.14	\$80	\$11.36	early summer
Butterfly Milkweed	<i>Asclepias tuberosa</i>	1.5%	0.9	0.56	\$180	\$100.81	early summer
Lavender Hyssop	<i>Agastache foeniculum</i>	8.0%	4.8	0.20	\$180	\$36.19	early summer
Purple Coneflower	<i>Echinacea purpurea</i>	8.0%	4.8	1.98	\$40	\$79.20	summer
Wild Bergamot	<i>Monarda fistulosa</i>	15.0%	9	0.31	\$200	\$62.73	summer
Virginia Mountain Mint	<i>Fycnanthemum virginianum</i>	10.5%	6.3	0.05	\$500	\$25.89	summer
Dotted Mint	<i>Monarda punctata</i>	15.0%	9	0.26	\$180	\$46.92	summer
Marsh Blazingstar	<i>Liatris spicata</i>	0.5%	0.3	0.13	\$450	\$59.81	late summer
Showy Goldenrod	<i>Solidago speciosa</i>	3.0%	1.8	0.05	\$200	\$9.33	fall
New England Aster	<i>Symphotrichum novae-angliae</i>	5.0%	3	0.11	\$200	\$21.49	fall
Little Bluestem	<i>Schizachyrium scoparium</i>	10.0%	6	1.86	\$20	\$37.13	-
Big Bluestem	<i>Andropogon gerardii</i>	5.0%	3	1.00	\$20	\$19.95	-
Indian Grass	<i>Sorghastrum nutans</i>	5.0%	3	0.96	\$20	\$19.18	-
TOTALS		100%	60.00	8.71	-	\$725.01*	

Wetland Pollinator Seed Mix

COMMON NAME	SCIENTIFIC NAME	% OF MIX	SEEDS / FT ²	LBS / ACRE	PRICE / LB	TOTAL PRICE	BLOOM TIME
Golden Alexanders	<i>Zizia aurea</i>	2.0%	1.2	0.27	\$150	\$40.84	spring
Virginia Spiderwort	<i>Tradescantia virginiana</i>	1.0%	0.6	0.01	\$300	\$4.48	late spring
Swamp Milkweed	<i>Asclepias incarnata</i>	1.0%	0.6	0.30	\$280	\$84.31	summer
Purple Coneflower	<i>Echinacea purpurea</i>	10.0%	6	2.48	\$40	\$99.00	summer
Blue Lobelia	<i>Lobelia siphilitica</i>	20.0%	12	0.08	\$260	\$16.34	summer
Wild Bergamot	<i>Monarda fistulosa</i>	10.0%	6	0.21	\$200	\$41.82	summer
Joe Pye Weed	<i>Eupatorium purpureum</i>	5.0%	3	0.17	\$220	\$37.83	summer
Boneset	<i>Eupatorium perfoliatum</i>	10.5%	6.3	0.14	\$200	\$27.44	summer
Marsh Blazingstar	<i>Liatris spicata</i>	0.5%	0.3	0.07	\$450	\$30.83	late summer
Sneezeweed	<i>Helenium autumnale</i>	10.0%	6	0.12	\$80	\$9.25	fall
Showy Goldenrod	<i>Solidago speciosa</i>	5.0%	3	0.08	\$200	\$15.56	fall
New England Aster	<i>Symphotrichum novae-angliae</i>	5.0%	3	0.11	\$200	\$21.49	fall
Big Bluestem	<i>Andropogon gerardii</i>	10.0%	6	2.00	\$20	\$39.90	-
Tussock Sedge	<i>Carex stricta</i>	5.0%	3	0.04	\$640	\$27.88	-
Fox Sedge	<i>Carex vulpinoidea</i>	5.0%	3	0.07	\$16	\$1.05	-
TOTALS		100%	60	6.21	-	\$497.82*	

Planting Test Plot - Before

2008



Planting Test Plot – After

2013



Resources – Xerces Society and USDA

FARMING FOR POLLINATORS

Native Bees and Bumblebees

Native bees are valuable crop pollinators. These wild bees help increase crop yields, and may serve as important insurance when honeybees are hard to come by.

There are simple and inexpensive things you can do to increase the number of native bees living on your land. Any work you do on behalf of pollinators will support other beneficial insects and wildlife. In addition, implementing practices that support native bees will help you avoid support from government programs.

Include your field notes information, along with a visual guide to identifying and enhancing native bee habitat on your farm.

THE XERCES SOCIETY GUIDE

Farming with Native BENEFICIAL INSECTS

THE XERCES SOCIETY GUIDE

Attracting NATIVE POLLINATORS

Protecting North America's Bees and Butterflies

Protecting North America's Bees and Butterflies

There are many ways to attract native bees and butterflies to your farm. This guide provides information on how to create a habitat that supports these important pollinators.

USDA National Agroforestry Center

AGROFORESTRY NOTES

August 2016

Agroforestry: Sustaining Native Bee Habitat For Crop Pollination

Introduction

Over one hundred species in North America require a wild space to survive and to reproduce. In the past, native bees and other insects benefited from the production of wild habitats, such as riparian areas, meadows, and other natural areas. However, these habitats have been largely converted to agricultural land, and native bees and other insects are now struggling to survive in these habitats.

USDA National Agroforestry Center

Using Farm Bill Programs for Pollinator Conservation

Introduction

The National Conservation Conservation Fact Sheet

USDA National Agroforestry Center

The Xerces Society for Invertebrate Conservation

SAN FRANCISCO STATE UNIVERSITY

POLLINATOR-FRIENDLY PARKS

How to Enhance Parks and Greenspaces for Native Pollinator Insects

POLLINATOR-FRIENDLY PARKS

How to Enhance Parks and Greenspaces for Native Pollinator Insects

POLLINATORS IN NATURAL AREAS

A Primer on Habitat Management

Introduction

Wildlife conservation programs provide a valuable resource for native pollinators. Pollinators are essential for many ecosystems, and their decline is a major concern for conservationists. This guide provides information on how to create a habitat that supports these important pollinators.

Conserving Bumble Bees

Guidelines for Creating and Managing Habitat for America's Declining Pollinators

Introduction

Bumblebees are important pollinators of many crops and wildflowers. However, their populations are declining due to habitat loss, pesticide use, and other factors. This guide provides information on how to create a habitat that supports these important pollinators.

POLLINATOR CONSERVATION HANDBOOK

A Guide to Understanding, Protecting, and Providing Habitat for Native Pollinator Insects

The Xerces Society for Invertebrate Conservation

In Association with The Bee Works

Featuring Photographs by Dr. Edward S. Ross

FARMING FOR BEES

Guidelines for Providing Native Bee Habitat on Farms

Introduction

Native bees are important pollinators of many crops and wildflowers. However, their populations are declining due to habitat loss, pesticide use, and other factors. This guide provides information on how to create a habitat that supports these important pollinators.

Butterfly Gardening

Nests for Native Bees

Plants for Native Bees

Introduction

Native bees are important pollinators of many crops and wildflowers. However, their populations are declining due to habitat loss, pesticide use, and other factors. This guide provides information on how to create a habitat that supports these important pollinators.

USDA National Agroforestry Center

Native Pollinators

Introduction

Native pollinators are essential for many ecosystems, and their decline is a major concern for conservationists. This guide provides information on how to create a habitat that supports these important pollinators.

Butterflies (Order: Lepidoptera)

Introduction

Butterflies are important pollinators of many crops and wildflowers. However, their populations are declining due to habitat loss, pesticide use, and other factors. This guide provides information on how to create a habitat that supports these important pollinators.

POLLINATOR BIOLOGY AND HABITAT

Introduction

Native pollinators are essential for many ecosystems, and their decline is a major concern for conservationists. This guide provides information on how to create a habitat that supports these important pollinators.

Native Bee Conservation Pollinator Habitat Assessment Form and Guide

Introduction

Native bees are important pollinators of many crops and wildflowers. However, their populations are declining due to habitat loss, pesticide use, and other factors. This guide provides information on how to create a habitat that supports these important pollinators.

Summary

Pollinator Habitat

- ▶ Provide Pollinators with:
 - ▶ Flowers: Pollen and Nectar
 - ▶ Nesting Sites – Ground, Tunnel, Cavities
 - ▶ Protection from pesticides
- ▶ Use Vermont's natural landscape to your advantage when managing/improving habitat for pollinators
- ▶ If planting, do your homework
- ▶ Resources available through USDA NRCS and Xerces

