NRCS Natural Resources Conservation Service

Pollinator Habitat Development

Maine Job Sheet for Herbaceous Plantings for Conservation Cover, code 327; Field Border, code 386; or Early Successional Habitat Development/Management, code 647

Sweat bee (*Agapostemon* sp.). Photo: Toby Alexander, Vermont NRCS.

Definition

Establishing and maintaining areas of diverse shrubs and wildflowers, with a focus on native species, to create flower-rich forage habitat (primarily offering nectar and pollen) for native bees, honey bees and other pollinators.

Purpose

This job sheet is provided as a component of a resource conservation plan. This activity may be applied to land taken out of agricultural production or to land adjacent to agricultural land, and dedicated to habitat for beneficial pollinators.

Where Used

This activity applies on lands requiring permanent protective cover that share a common border or are within ¼ mile of an agricultural field, and areas being converted from agricultural production. Examples of appropriate locations include margins of fields, forest or wetlands and early successional habitat (e.g., shrubland, old field, grassland). Particularly important are areas within or adjacent to agricultural operations with crops requiring cross-pollination to produce fruit (e.g., orchards, lowbush blueberry barrens, highbush blueberry operations, cranberry bogs, tomato and squash and other truck crops).

Larger areas of habitat (1/2 acre or more) will provide an opportunity to support more pollinators, flower-rich habitat can be created in small patches or strips and still provide benefits for pollinators. This job sheet consists of several separate sections. Each section will cover separate, but very important topics. The separate sections may be used independently or in combination depending on the type of habitat management being planned.

I. Site Preparation

II. Planting and Maintenance of Beneficial Herbaceous Plants

III. Operation and Maintenance

IV. Practice Specification Sheet

V. Plant lists

General Criteria and Specifications

Criteria and specifications of the NRCS conservation practice under which pollinator habitat is planned, designed and installed will be in effect.

<u>Low Management and Low Cost Non-Native Planting Scenario</u>

Direct seeding of introduced clovers, alfalfa, and other low cost crops to improve heath of managed honey bees and increase numbers of native bumble bees in the landscape. Minimum size 3 acres, with 5 acres preferred. Such low-cost species can be "frost seeded" by broadcasting onto bare ground or into melting snow anytime between February and March. See the table on page 8 for non-native herbaceous species to plant.

<u>Intensive Management and Higher Cost Scenario</u>

Late fall dormant seeding (November to freeze-up) of a variety of native perennial flowering plants with high quality pollen and nectar. Increased cost is due to intensive site preparation and seed cost followed by weed control the first couple years after seeding. Minimum size is ½ acres. Site preparation involves repeated application of a non-persistent broad spectrum herbicide, shallow

cultivation, and post-planting mowing to reduce competition from grasses and other herbaceous plants. See the tables on pages 5 & 6 for suitable native species to plant. *The 1st five in the table establish particularly well in New England.* For organic operations, an alternative to chemical herbicide is repeated application of horticultural vinegar to brown existing vegetation prior to tilling.

I. Site Preparation for Pollinator Plantings

Competition Control Prior to Planting

Site preparation is **one of, if-not-the, most important** component needed for planting success, and is often inadequately planned and applied. It is also a process that may require a year or more of effort to reduce competition from invasive, noxious or undesirable plants prior to planting. *In particular, site preparation should focus on the abatement of perennial weeds*. The more effort and time spent eradicating undesirable plants prior to planting will result in higher success rates in establishing the targeted plant community. Create a clean seedbed by shallow disking in several directions; tamp soil prior to seeding. With heavy weed pressure, do not till and use no-till planting techniques (flail mowing stubble, etc).

Option 1: Site Preparation with Non-selective, Non-persistent Herbicide	**Complete During**
Year 1	
Mow and apply non-selective herbicide when weed seedlings reach 4 - 6 in.	May
Mow and apply non-selective herbicide when weed seedlings reach 4 - 6 in.	July
Mow and apply non-selective herbicide when weed seedlings reach 4 - 6 in.	September
Prepare a clean seedbed by lightly tilling (rake debris from site) or use no-till; broadcast seed, or use a drop or drill seeder ideally before first snowfall.	November
Year 2	
Manage weeds by setting a mower blade at 6 – 10 inches and mow every 4 to 6 weeks as needed to keep weeds from flowering and seeding. Most pollinator flowers will not bloom first year.	Spring, Summer, Fall
Apply grass selective herbicide (as needed)	June
Year 3	
Conduct regular weed control (monthly basis) by spot-spraying or applying herbicide with wicks or sponge to ensure annual weeds do not set seed and that perennial weeds are removed from site or mow as in year 2. Monitor and treat as needed thereafter.	Spring, Summer, Fall
Option 2: Organic Site Preparation	
In this scenario, site preparation is accomplished by smother cropping.	**Complete During**
Year 1	
Cultivate to create a clean seedbed	Spring
Cover crop with annual buckwheat. *Note: Site preparation and success will be increased by cover cropping with buckwheat for two full growing seasons.*	Summer
Mow buckwheat prior to seed development	Summer
Re-plant in a cover crop that will winter kill (e.g. a second late season planting of buckwheat, oats, or annual rye)	August
Year 2 *(or Year 3 if cover cropping for two growing seasons)*	
Plant seed by broadcasting seed, or use of a drop or drill seeder	Spring
Manage weeds by setting a mower blade at 6 – 10 inches and mow every 4 to 6 weeks as needed to keep weeds from flowering and seeding. Most pollinator flowers will not bloom first year.	Spring, Summer, Fall
Year 3 *(Year 4 if cover cropping for two growing seasons)*	
Control weeds using approved organic techniques especially before seed set.	Various

II. Planting and Maintenance

Native wildflowers shall be planted in mixes to promote a diversity of flowering plants over the growing season to provide cover, food and nectar for pollinators. A list of beneficial herbaceous native plants is provided on page 5 and non-native herbaceous plants on page 7.

When identifying planting sites, remember that bigger habitat patches that are closer together, or interconnected will support more abundant populations of pollinators than smaller, isolated patches. Locate plantings where chemical drift will not be a problem.

Species Mixes

Species chosen for planting need to provide pollen and nectar resources for the entire growing season. A minimum of nine flowering plants should be used. Species mixes for native plantings will have at least two early-flowering species, and 3 or more mid and late flowering species. A diversity of flower colors shall be planted. Ideally a native seed mix should have one native warm season grass or sedge included that comprise no m ore than 10 - 15% of a mix. Due to the fewer number of desirable non-native forbs available, these species should be used for plantings when a field already has flowering plants established and the planted species can increase diversity to least 9 flowering plants.

Seeding

The appropriate seeding method will depend on the size of the area and available equipment. For small areas, seed may be broadcast by a hand, or with a hand-held seed spreader. For larger areas, a drop seeder, or ATV-mounted broadcast seeder might be more appropriate. Alternatively, special native plant seed drills may be used. Standard row crop planters (for example, corn seed drills) may place wildflower seed too deep and should not be used.

Whatever method is chosen, equipment should be calibrated prior to use to be sure that the seed is being sown at the recommended rate. Because the drop-rate can become inconsistent when the amount of seed in the equipment dispenser gets low, it is important to make sure an ample amount of seed is loaded into the equipment, both for calibration and actual seeding. Fine play sand, rice hulls, or dry peat moss can be mixed into seed mixes at a 50/50 ratio in order to facilitate equal seed distribution. This can be particularly useful when seeding small areas, or when broadcasting very small seed. In addition, irrespective of method employed, thoroughly clean all equipment before and after use to avoid planting seeds from previous jobs.

When broadcast seeding divide the mixture into two equal quantities and applying half of it in one direction and the second half in a perpendicular direction to more evenly distribute seed. Since seed sizes in a mix may vary considerably, it may be necessary to sort a seed by size and broadcast the mix using multiple passes. For even distribution, seed can be mixed 50:50 with a slightly damp inert material such as sawdust, play sand, rice hulls, peat moss, kitty litter or vermiculite.

III. Operation and Maintenance

Monitoring and controlling weeds is very important; especially during the 1st and 2nd years post-planting. Mow every 4 – 6 weeks to prevent weeds from flowering and going to seed. Mow at a height of 6 inches or higher, whatever is necessary to achieve the desired effect. Native plants will grow deeper root systems than tops the 1st year, so mowing will not affect them. If possible, use of higher mower blade heights during the 2nd year is desirable. Very targeted application of specific herbicides can also be used to control weeds, but avoid heavy spraying that can affect pollinator planting and pollinators themselves.

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IV. Practice Specification Sheet

For:	***Farm #:***
	Tract #:
Designed By:	***NRCS Job Authority Approval By:*** ***Signature:***
Date:	***Date:***

Management Goals/Objectives:

Site Preparation and General Planting Information			
Type of Planting		**Acres to Plant =**	
Site Preparation Option			
Desired Seed Density (seeds/ft^2) =			

	Bloom Period	Species to Plant	% of Mix	Lbs of Seed[1]	Seeding Method	Time of Seeding[2]
Minimum of Eight Flowers + 1 Grass or Sedge for Native Plantings and 9 Species for Introduced Plantings	Early (Spring) Bloom					
	Mid (Summer) Bloom					
	Late (Fall) Bloom					
		Totals	0	0		

[1] – <<Click here>> for a seed calculator developed by the The Xerces Society to determine lbs of seed needed and to determine seed cost based on information obtained from seed vendors.
[2] – Spring Seeding – Apr 15 – Jun 30; Dormant Seeding Nov– Freeze-up; Frost Seeding Feb – Mar 15

Operation and Maintenance *(required)*:

Additional Specifications *(required)*:

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ADDITIONAL INFORMATION:

a. You have a copy of practice specifications and should understand their contents including the scope and location of the practice. If not, get in contact with your NRCS Field Office.

b. You must obtain all necessary permits and/or rights in advance of practice application, and must comply with all ordinances and laws pertaining to the application of this practice.

c. No changes will be made in the installation of the job without prior concurrence of the NRCS.

d. Maintenance of the installed work is necessary for proper performance during the life of the practice. The practice life is _____ years.

RECORD OF COMPLETION AND CHECK OUT CERTIFICATION:

Treated Acres:	Date Completed by Client:	Date Inspected:	Inspector's Initials:

This practice as applied meets NRCS standards and specifications: ☐ Yes ☐ No (see notes below)

NRCS Representative Name and Title:			
NRCS Representative Signature:		Date:	
Notes:			

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V. Maine Pollinator Plants – High Quality Native Herbaceous Species

Common Name	Scientific Name	Origin	Bloom Season[1]	Flower Color[2]	Habitat[3]	Wetland Status	Cold Stratify[4]	Seeds Per Pound[5]
Smooth Penstemon	*Penstemon digitalis*	Native	Early	white	Mesic – Dry	FAC	No	400,000
Wild Bergamot	*Monarda fistulosa*	Native	Mid	Pink, blue, red	Mesic – Dry	UPL	No	1,250,000
Eastern Columbine	*Aquilegia canadensis*	Native	Early	Red w/Yellow	Dry	FAC	Yes	504,000
Lance–leaved Coreopsis	*Coreopsis lanceolata*	Native	Late	Yellow	Mesic	FACU	No	221,000
Maximilian's Sunflower	*Helianthus maximiliani*	Native	Late	Yellow	Mesic – Dry	UPL	Yes	216,000
Virginia Mountain Mint	*Pycnanthemum virginianum*	Native	Mid	White	Mesic – Dry	FAC	No	3,872,000
Common Milkweed	*Asclepias syriaca*	Native	Mid – Late	Rose – purple	Mesic – Dry	NI	No	70,000
Purple–node Joe Pye Weed	*Eupatorium purpureum*	Native	Late	Pink – purple	Mesic – Dry	FAC	Yes	672,000
Wild Mint	*Mentha arvensis*	Native	Early	White	Wet – Mesic	FACW	No	4,800,000
Heath aster	*Symphyotrichum pilosus*	Native	Late	White-Purple	Mesic – Dry	UPL	Yes	700,000
Pale Purple Coneflower	*Echinacea pallida*	Native	Mid	Pink – purple	Mesic	NI	Yes	116,000
Black-eyed Susan	*Rudbeckia hirta 'Golden Jubilee'*	Native	Mid - Late	Yellow-Orange	Mesic – Dry	FACU	No	1,576,000
Arrow–leaved Aster	*Symphyotrichum urophyllum*	Native	Late	White – light blue	Mesic – Dry	NI	Yes	2,000,000
Cardinal Flower	*Lobelia cardinalis*	Native	Mid	Red	Wet – Mesic	FACW	No	11,293,000
Big-leaved Aster	*Aster macrophyllus*	Native	Late	White-lavendear	Mesic	NI	Yes	800,000
Boneset	*Eupatorium perfoliatum*	Native	Late	White-lavendear	Wet – Mesic	FACW+	Yes	2,880,000
Ohio Spiderwort	*Tradescantia ohiensis*	Native	Early–Mid	Blue	Mesic	FAC	Yes	128,000
Meadow Bottle Gentian	*Gentiana clausa*	Native	Late	Blue	Wet – Mesic	FACW	No	2,980,000

Common Name	Scientific Name	Origin	Bloom Season[1]	Flower Color[2]	Habitat[3]	Wetland Status	Cold Stratify[4]	Seeds Per Pound[5]
Butterfly Milkweed	*Asclepias tuberosa*	Native	Mid	Orange	Dry	NI	No	70,000
Swamp Milkweed	*Asclepias incarnata*	Native	Late	Red – pink	Wet	OBL	No	70,000
Golden Alexanders	*Zizia aurea*	Native	Mid	Yellow	Mesic	FAC	Yes	172,000
Joe Pye Weed	*Eupatorium fistulosum*	Native	Late	Pink – purple	Wet – Mesic	FACW	Yes	2,000,000
Spotted Joe Pye Weed	*Eupatorium maculatus*	Native	Late	Light purple	Wet – Mesic	FACW	Yes	1,440,000
Wild Golden Glow	*Rudbeckia laciniata*	Native	Mid	Yellow	Wet – Mesic	FACW	No	252,222
Sneezeweed	*Helenium autumnale*	Native	Late	Yellow	Wet – Mesic	FACW	No	1,464,000
New England Aster	*Symphyotrichum novae–angliae*	Native	Late	Blue, purple	Wet – Mesic	FACW	Yes	1,100,000
New York Aster	*Symphyotrichum novi–belgii*	Native	Late	Blue, purple	Wet – Mesic	FACW	Yes	700,000
Little Bluestem Grass	*Schizachyrium scoparium*	Native	Mid - Late	White	Dry – Mesic	FACU	No	200,000
Indiangrass (NE-Holt variety)	*Sorghastrum nutans*	Native	Late	Yellow	Dry	UPL	No	175,000
Canada Wildrye	*Elymus canadensis*	Native	Mid-Late	Yellowish	Dry – Mesic	FACU	No	114,000
Lurid Sedge	*Carex lurida*	Native	Mid	Green	Wet	OBL	No	250,000
Blunt Broom Sedge	*Carex scoparia*	Native	Late	Greenish - Brown	Wet – Mesic	FACW	No	1,344,000

[1] – Ideally, for a mix pick at least 2 early–, 3 mid– and 3 late–season blooming plants. Where herbaceous species are unavailable for a specific bloom period, woody plants may help extend pollen and nectar resources.
[2] – Flowers colored blue, purple, violet, white, and yellow are particularly attractive to bees.
[3] – Plants with a broader dry-to-wet adaptation may have a greater chance of establishing on a variety of different sites, than those with more specific habitat needs.
[4] – Seeds of plants needing cold stratification need to be seeded during late fall as they require weathering cold temperature for several months to germinate.
[5] – There should be 40 – 60 seeds per square foot no matter the species mix used. Considering 100% live seed is seldom the case, planting at heavier densities (50 – 60 seeds/ft^2) is recommended. Multiply the square foot of the area to be planted by either 40, 50 or 60 to determine how much seed is needed and from the table above you can determine the # lbs of each species to order.

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Maine Pollinator Plants –Non-Native Herbaceous Species

Common Name	Scientific Name	Origin	Bloom Season[1]	Flower Color[2]	Habitat	Wetland Status	Cold Stratify[3]	Seeds Per Pound[4]
Alfalfa	*Medicago sativa*	Introduced	Early	Purple	Mesic – Dry	NI	No	227,000
Red Clover	*Trifolium pratense*	Introduced	Early– mid– Late	Red	Mesic – Dry	FACU	No	272,160
White Clover	*Trifolium repens*	Introduced	Mid – Late	White	Mesic	FACU	No	776,000
Perennial Blue Flax	*Linum perenne*	Introduced	Early – Mid	Blue	Dry	NI	Yes	294,848
Blanketflower	*Gaillardia aristata*	Introduced	Mid – Late	Orange	Mesic – Dry	NI	No	186,000
Upright Coneflower	*Ratibida columnifera*	Introduced	Mid – Late	Orange	Mesic – Dry	NI	No	83,200
Crimson Clover	*Trifolium incarnatum*	Introduced	Early	Red	Mesic – Dry	NI	No	150,000
Alsike Clover	*Trifolium hybridum*	Introduced	Early	White - Pink	Mesic	FACU	No	680,000
Canola	*Brassica napus*	Introduced	Early –Mid	Yellow	Mesic – Dry	NI	No	160,000
Sweet White Clover	*Melilotus alba*	Introduced	Mid	Yellow	Mesic – Dry	FACU	No	258560
Buckwheat	*Fagopyrum esculentum*	Introduced	Late	White	Somewhat Wet – Dry	NI	No	15,000

[1] – Ideally, for a mix pick at least 3 early–, 3 mid– and 3 late–season blooming plants. Where herbaceous species are unavailable for a specific bloom period, woody plants may help extend pollen and nectar resources.
[2] – Flowers colored blue, purple, violet, white, and yellow are particularly attractive to bees.
[3] – Seeds of plants needing cold stratification need to be seeded during late fall as they require weathering cold temperature for several months to germinate.
[4] – There should be 20 – 40 seeds per square foot no matter the species mix used. Considering 100% live seed is seldom the case, planting at heavier densities (30–40 seeds/ft^2) is recommended. Multiply the square foot of the area to be planted by either 30 or 40 to determine how much seed is needed and from the table above you can determine the # lbs of each species to order.