

# Creating Pollinator Habitat in Pastures, Grasslands, and Associated Lands

## Conventional Site Preparation and Maintenance

This fact sheet provides general guidance on establishment and cost estimates for converting grasslands, pastures, or associated lands comprised primarily of non-native grasses into a diverse mix of native forbs and grasses which can support a diversity of pollinator species. This fact sheet describes conventional farming practices and is designed for use with Conservation Reserve Program (CRP) CP42 Pollinator Habitat or Wildlife Habitat Planting (420).

### **Setting Expectations—Establishment Takes Time and Patience!**

- Conventional site preparation (site prep) will take *at least* one full growing season. The time and effort required to successfully prepare a site will vary depending on starting conditions and history of the site. Eliminating the existing vegetation and exhausting the historical seedbed is a crucial step prior to seeding the desired native species. Poor or failed habitat plantings are often the result of inadequate site prep.
- The phrase, “Sleep, creep, and leap!” describes plant establishment during the first three years after sowing. During the first two years of establishment, perennials will invest most of their energy into growing a strong root system, leading to minimal aboveground growth. With proper site prep, much of the noticeable first year vegetation will be annuals and biennials from the native seed mix, with only small amounts of persistent grasses or weeds from the soil seedbank.
- In years two and three, the native perennials will begin to bloom, and with time and proper management, will dominate the site. By the end of the third year, a successful pollinator habitat planting will have approximately 85% cover of native species, with *a minimum* of three species per bloom period (early, mid, and late season).

### **Implementation**

- When planning and implementing pollinator habitat, it is crucial that ample consideration and effort is given for site prep *prior to planting*. The thoroughness of site prep will directly affect the project’s success and will require a year or more of attention. The goal of site prep is to eliminate the existing vegetation and reduce or remove dormant seeds in the soil. This ensures seeds will receive the necessary seed to soil contact and have adequate space to grow, which is necessary for successful establishment during the seedling phase.

**During site selection, talk with your local USDA Service Center to ensure that your site(s) meet CP42 size requirements and includes necessary buffers from pesticide exposure. Avoid sites with a history of hard to control weed species or those located near such areas.**

- A site is considered properly prepared and ready to be seeded when less than 5% of the original vegetation or undesirable species remain. However, aggressive (i.e., species with fast spreading rhizomes) and invasive vegetation must be closely monitored and removed immediately, even at less than 5 %.
1. Mow site in spring once the field is accessible (dry enough to handle equipment) and remove thatch. Allow vegetation to grow and then have a certified pesticide applicator apply a non-selective, non-persistent herbicide per label instructions.
  2. Monitor the site every two to three weeks throughout the spring and summer. Follow-up herbicide applications and mowing/string trimming will be required to eliminate persistent/undesirable vegetation as it reappears and before it goes to seed. Remove thatch.
  3. Sites with low to moderate weed pressure typically require one to two follow up treatments, while sites with high weed pressure will typically require at least three additional treatments to eliminate persistent/undesirable vegetation.
  4. Assess the site in late summer.
    - a.) **If at least 95% of the original vegetation and undesirable species have been eliminated:** rake off residue and prepare for seeding. For erosion control and additional weed suppression, consider sowing oats (*Avena sativa*) as a nurse crop between Aug. 15th and Sept. 15th at 30-50 lb/ac. Sow the native seed mix into the standing oats in late fall.
    - b.) **If unacceptable weed competition is still present:** continue site prep and repeat the entire process (steps 1-4) until the original vegetation has been eliminated and the seedbed exhausted. If sowing oats as a winter cover crop, remove all residue and sow oats between Aug. 15th and Sept. 15th at 80-125 lb/ac. Use the higher rate if broadcast seeding.

## Seeding Considerations

- Best practices for seeding will depend on the size and moisture conditions of the site. Seeds are best planted in the fall after the first hard frost but may need to be planted in early spring if the site is prone to wet conditions in the fall. If oats were used as a nurse crop during site prep, the native seed mix should be sown directly into standing oats in late fall. Seeding success is also dependent on proper equipment use. Broadcast seeding and cultipacking are used for smaller scale plantings (<5 ac). Large scale plantings (>5 ac.) can be effectively installed using a specialized native seed drill that has been carefully calibrated, or a calibrated drop seeder followed by cultipacking.
- **Do not plant the seed too deep – wildflower seeds must not be sowed deeper than ¼”.** Very small wildflower seeds, such as wild bergamot (*Monarda* spp.), should be sown on the soil surface. To ensure even distribution and proper seeding rates, it is recommended to mix wildflower seeds with an inert carrier (e.g., sand, cracked-corn, vermiculite, clay-based kitty litter, saw dust, pelletized lime, etc.) at a ratio of 2:1 or 3:1 (carrier to seed, by volume). If you need assistance determining the carrier-to-seed ratio, please contact your local Ag Extension Agent or the seed supplier.
- Seed mix designs for this conservation practice must be provided by or approved by NRCS before purchase and will require a custom quote from a native seed vendor. An approved seed mix will always contain a **minimum** of nine species of native pollinator-friendly wildflowers, with at least three species that bloom in each season (spring, summer, and fall). The overall seeding rate must be no less than 20 pure live seeds (PLS)/ft<sup>2</sup> for CP42. More than nine species of pollinator friendly plants are highly encouraged but not required. Native grasses (such as little bluestem) are not required, but if included, should not exceed 25% of the mix based on PLS/ft<sup>2</sup>.

**Table 1: Conventional Site Preparation Timeline and Activities for CRP Pollinator Habitat Establishment**

Site Prep Year	Spring	Summer – Early Fall	Mid – Late Fall
Year 1: <b>Required</b>	Mow site and spray regrowth.	Herbicide application(s). Monitor and mow/string-trim/ spot-spray as needed (multiple treatments will be necessary).	Assess site for readiness. If repeating site prep, add winter kill cover crop (oats). If site is prepared, dormant seed (or seed in spring if needed).
Year 2: <b>Discretionary</b>	If weeds persist, continue site prep. Otherwise, consider a spring seeding.	Herbicide application(s) as needed. Monitor and mow/string-trim/spot-spray as needed (multiple treatments may be necessary).	Assess site for readiness. If repeating site prep, add winter kill cover crop (oats). If site is prepared, dormant seed (or seed in spring if needed).

## Management During Establishment and Beyond

- Maintenance and monitoring are required throughout the contract to ensure that the installation will function as pollinator habitat and not revert to a degraded condition or become dominated by woody vegetation.

### Mowing is Crucial for Successful Establishment

- After seeding the site, mow to a height of 6-8” when vegetation reaches 10-12” in year one and when vegetation reaches 12-18” in year two. *Do not mow lower than 6 inches.* Repeat mowing as many times as necessary (typically two to three times per growing season but will vary depending on the site and weather conditions). Mow when the weeds or other undesirable vegetation are flowering, do not let weeds set seed. Mowing will also trim some of the native plant growth, and that’s okay! This action is critical for reducing competing vegetation and will allow the native plants to establish well. By the third year, plants from the seed mix should be established and management of undesirable species may only require spot mowing, spot spraying, string trimming, or hand-weeding.
- Long-term management (after year 3 and beyond): rotationally mow 1/3 of the site to a height of 6-8” each year. This will help sustain a diverse habitat that is free of woody encroachment. Mowing between Oct. 1 - May 1 will limit disturbance of high monarch activity (migration and reproduction).
- To help reduce wildlife injury and mortality from mowing, install a flushing bar to the front of the tractor. This will create an early disturbance, giving wildlife time to safely relocate.
- During and after establishment, be sure to prevent the spread of invasive species or noxious weeds. Some species may require specific timing and frequency for effective control. Contact your local NRCS or Extension Service for additional guidance.

**Table 2: Maintenance After Seeding Habitat Mix**

After Seeding Habitat	Management Regime—Spot Spray as Needed	# of Treatments
Year 1	Mow to a height of 6-8” when vegetation reaches 10-12”. Spot treat invasive/noxious species as needed.	Typically, 2-3 times per growing season.
Year 2	Mow to a height of 6-8” when vegetation reaches 12-18”. Spot treat invasive/noxious species as needed.	Typically, 2-3 times per growing season.
Year 3	Spot mow, string trim, or hand-weed undesirable/weed species.	Typically, 1-2 times per growing season.
Year 4 and Beyond	Mow only 1/3 of the site to a height of 6-8”. Spot treat invasive/noxious species as needed.	Only 1 time per year between Oct. 1— May 1 to avoid high monarch activity.

## Cost Considerations

- The table below outlines the potential cost range for implementing, establishing, and managing pollinator habitat with CP42 using Wildlife Habitat Planting (420). Please refer to the footnotes below the table for important details about how these variable costs were estimated.
- For CP42, cost-share of up to 50% of the reimbursable cost of installing approved practices is provided by the Farm Service Agency (FSA), as well as annual rental payments for land enrolled in 10-to-15-year contracts. Cost-share assistance is not available for any management activity (such as maintenance mowing) for CP42. If you have questions about cost share payments for CP42, please contact your local FSA office. For questions regarding habitat implementation and management, please contact your local Natural Resources Conservation Service (NRCS) office.

**Table 3: Estimated Cost Considerations for Creating Pollinator Habitat**

DIY and/or using local co-ops and partnerships				Contracted <sup>9</sup>			
Recommended Methods <sup>1</sup>	Equipment <sup>2</sup> & Materials	Est. Cost Per Acre	Labor/Notes	Contracted Activity <sup>9</sup>	Est. Cost Per Acre <sup>10</sup>	Notes	
Implementation (Site Preparation)	Pre-spray mowing	Tractor, mower, or brush-hog	Fuel cost <sup>3</sup>	Mow 1-3 times, depending on regrowth	Pre-spray mowing	\$75-\$200	Highly dependent on density of vegetation and total acreage of site
	Spray-out with herbicide	Tractor, boom sprayer, or ATV, herbicide mix	\$27-\$81 herbicide mix + fuel cost	Spray 1-3 times, depending on need	Spray-out with herbicide <sup>4</sup>	\$150-\$1,000	
	Seeding	Native seed mix <sup>5</sup> + seed carrier <sup>6</sup>	\$250-\$1,710	Seed mix varies by region and seed availability	Seeding	\$250-\$1,710 for native seed mix <sup>5</sup>	Seed mix may be purchased separately by landowner from a native seed vendor
		Native seed drill <sup>7</sup> or broadcaster <sup>8</sup>	\$0-\$20 + fuel cost	0.5-1 hour/ac (longer if calibrating native seed drill)		\$125-\$350 for drilling or broadcasting	Dependent on project size: broadcast seeding will be on the low-end estimate, native seed drilling on the high-end
		Cover Crop (oats)	\$15-\$125 + fuel costs	Nurse Crop: 30-50 lb/ac; Winter Cover Crop: 80-125 lb/ac		\$140-\$480 for drilling or broadcasting	Price will vary depending on project size, seeding method, and rate.
Establishment (Years 1-4)	Maintenance mowing	Tractor, mower, or brush-hog	Fuel cost	Mow ~2-3 times in years 1-2 Spot mow, string trim, or hand-weed in year 3 Mow only 1/3 of the site once in year 4 and beyond	Maintenance mowing, spot-spraying, spot mowing, hand-weeding	\$330-\$2,400; plan for 1-3 site visits per year	Site visits include monitoring and management of weeds, and a site evaluation will determine what activities are needed
	Spot spray, hand-pull weeds	Backpack-sprayer, weeding tools, mower, herbicide mix	\$7-\$345 for herbicide mix	Expect ~1-10 hrs. of management, 1-3 times per year			
<b>Estimated Cost per Acre<sup>11</sup>: \$299-\$2,281 + fuel costs</b>				<b>Estimated Cost per Acre<sup>11</sup>: \$1,070-\$6,140 + fuel costs</b>			

<sup>1</sup> Recommended methods are representative of projects between 0.5 to 10 acres.

<sup>2</sup> Equipment is assumed to be in possession of the landowner prior to the project. Equipment may be rented from a local Conservation Districts (e.g., SWCD) at reasonable costs.

<sup>3</sup> Fuel cost will depend on the size of equipment, current fuel prices, and how many passes are required.

<sup>4</sup> Herbicide applications must follow label instructions, as well as federal, state, and local laws.

<sup>5</sup> Seed mix diversity (# of species in a mix) may affect cost, with a low diversity (9 species) at the low-end and a high diversity mix (>50 species) at the high-end of the cost range.

<sup>6</sup> Some seeding methods require that a carrier/bulking agent be added to the mix (e.g., sawdust, rice hulls, vermiculite, etc.).

<sup>7</sup> Native seed drills can be rented at many local SWCD for \$5-25/ac, plus a delivery fee.

<sup>8</sup> Broadcast seeding methods will increase seeding rate up to 20%.

<sup>9</sup> Contracted third parties, such as restoration firms, LLCs, or any contracted hire. These cost estimates are highly variable and dependent on the size of the project, travel time to site, and complexity of the project (e.g., ease of access, topography, weed pressure, etc.). Cost ranges are approximate and individual project quotes should be sought if planning to use a third-party contractor. Costs per acre decrease as the size of the project increases.

<sup>10</sup> Some contractors charge a daily rate (e.g., \$1916/day), for a fully loaded 2-person crew with equipment, instead of per activity, and/or may have a site visit minimum.

<sup>11</sup> Totals are calculated as follows: minimum range is sum of all activities at the minimum cost estimate; maximum range is the sum of all activities at the maximum cost estimate.

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