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Using 2014 Farm Bill Programs for Pollinator Conservation

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Cover photos: Clockwise from top left: Monarch butterflies feed on pentas (L. Pete Heard, USDA NRCS); Bumble bees on a squash blossom (Nancy Lee Adamson, Xerces Society); Blooming field border planting in Montana (Jennifer Hopwood, Xerces Society).

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Introduction

More than 30 percent of our food relies on insect pollination, which is overwhelmingly provided by bees. Honey bees are estimated to support $15 billion in crop production, while wild native bees supply an estimated $3 billion in pollination services. Native bees have declined due to habitat loss and use of pesticides, among other factors. The health of honey bees, our primary managed crop pollinator, has also deteriorated in recent years. Managed colonies of European honey bees have suffered a 50-percent decline in recent decades and face immediate threats from pesticide exposure, habitat loss, invasive diseases, and pests. These threats to beekeepers have led to unsustainable annual winter losses. Between 2006 and 2014, approximately one in three managed honey bee hives were lost each winter (http://beeinformed.org//).

Recent research has shown that wild native bees, which number more than 4,000 species in North America, contribute substantially to crop pollination on farms where their habitat needs are met. In some cases studied, such as squash production in New Jersey, native bees provided 100 percent of the necessary pollination. As securing hives of European honey bees for crop pollination becomes more difficult and expensive, protecting and restoring habitat for native pollinators becomes ever more important. This same pesticide-free habitat is also critical for helping to support local beehives and can help sustain beekeeping operations.

The Agricultural Act of 2014, otherwise known as the Farm Bill or 2014 Act, authorizes the USDA to undertake a broad range of incentive-based conservation programs on agricultural land (table 1).

The 2014 Farm Bill builds upon the 2008 Farm Bill and earlier rulemaking. Prior to the 2008 Farm Bill, the USDA established conservation of pollinator habitat as a goal of the Conservation Security Program (now the Conservation Stewardship Program (CSP)) and a priority for the Conservation Reserve Program (CRP) State Acres for Wildlife (SAFE) practice. The 2008 Farm Bill made pollinators and their habitat a priority for USDA, and authorized special consideration when determining payments for practices that promote pollinator habitat during Environmental Quality Incentive Program (EQIP) implementation. Wild and managed (both native and introduced) pollinators are to be considered during the review or development of Farm Bill conservation practice standards. Most important of all, the 2008 Farm Bill authorized the Secretary of Agriculture to encourage “the development of habitat for native and managed pollinators; and the use of conservation practices that encourage native and managed pollinators” during administration of any conservation program.

With the 2014 Farm Bill, Congress again recognized that pollinators are a crucial part of healthy agricultural and natural landscapes. The 2014 Act retains all of the pollinator conservation provisions of the 2008 Farm Bill and adds targeted support for the creation of honey bee habitat. The 2014 Farm Bill condenses 23 conservation programs into 13 (see "Comparison of 2008 and 2014 Farm Bill Programs" on the NRCS Web site), retaining all of the conservation practices that can be used to create or improve pollinator habitat.

This technical note—

- Outlines opportunities within current Farm Bill programs for NRCS field staff to help eligible producers implement conservation practices and activities that benefit pollinators, (see section: Field-level Opportunities).
- Identifies opportunities for NRCS State, area, basin, and watershed offices to support conservation of crop-pollinating native bees and provide habitat for European honey bees (see section: State-level Opportunities) by developing technical notes with State-appropriate plant lists, conservation program fact sheets, and other guidance documents for field conservationists.

- Summarizes the existing pollinator conservation guidance developed by and for most NRCS State offices in the United States.

NRCS programs focus on supporting habitat protection and creation that has multiple benefits for agriculture and surrounding environments. Protecting and creating habitat for native bees and honey bees also supports an array of other pollinators and beneficial insects, such as butterflies, moths, flies, beetles, and wasps, including predators and parasitoids of crop pests. Native bees have a keystone role in the healthy and complex food webs that support diverse wildlife, feeding other wildlife either directly or by producing many of the plants and plant fruits that sustain birds, mammals, and other wildlife. These conservation practices fundamentally protect watershed health, help improve water infiltration, and reduce runoff and soil erosion from farmlands.

In addition, the NRCS and Farm Service Agency (FSA) targeted $3 million through EQIP and $8 million through CRP in fiscal year (FY) 2014 to improve habitat for honey bees in the core honey bee-resting and honey-producing States in the Upper Midwest (North Dakota, South Dakota, Minnesota, Wisconsin, and Michigan). This is similar to a 2009 effort in California, where the California NRCS State office targeted approximately one-third of their Wildlife Habitat Incentive Program (WHIP) funding to pollinator conservation projects in the State. It is possible that such targeted efforts will continue, or even expand to address other critical or iconic pollinators in decline, such as the monarch butterfly.

Field-level Opportunities

Contracting pollinator conservation projects using current conservation practices under EQIP

Tables 2 and 3 provide details on how current EQIP conservation practices can be used to benefit pollinators, particularly crop-pollinating native bees and honey bees, as well as other beneficial insects (predators and parasitoids of crop pests). Pollinator conservation practices provide permanent or seasonal habitat to—

- Increase the abundance of pollen and nectar.
- Expand the availability of blooming plants through the growing season, ideally from early in the spring (e.g., willow) through late fall (e.g., goldenrod).
- Add or protect potential nest sites.
- Provide refuge from pollinator–toxic pesticides.

Most of the conservation practices outlined in table 2 allow field office planners to include diverse flowering plants that provide sequential bloom through the growing season. Some practices allow for creation or protection of nest sites, such as snags, brush piles, or stable untilled ground for solitary bees, or small cavities (usually created by rodents) for bumble bees. Any practice that increases areas of pollinator habitat that are not exposed to pesticides or creates buffers to reduce pesticide drift will minimize harm to pollinators and other beneficial insects (see The Xerces Society publication *Farming for Bees: Guidelines for Providing Native Bee Habitat on Farms* for more information). Whenever possible, conservation planners should consider using native plants since native pollinators and other wildlife are adapted to them for food and shelter. However, for many farm landscapes, the inclusion of nonnative, noninvasive plants can be a less expensive and useful strategy. For example, NRCS is increasingly interested in supporting honey bees, as well as soil health. Planners should consider adding or diversifying cover cropping practices, or incorporating noninvasive forage legumes into pasture or biomass plantings to create temporary but high-value blooming crops. These practices will benefit managed honey bees in farm or ranch landscapes while also breaking pest cycles, improving soil tilth, reducing erosion, and adding soil nutrients. To be of benefit to bees and other pollinators, these crops need to be allowed to complete their bloom cycle before they are terminated.

Table 2 lists conservation practices contracted under the EQIP program and describes the potential for each practice to supply or improve habitat for pollinators. The pollinator notes column describes pollinator habitat components that can be provided by each practice and offers recommendations for management practices to benefit or reduce harm to pollinators (for those such as mowing or fire that require careful timing). Table 3 presents the general habitat requirements of pollinators and lists the conservation practices that can be used to supply these requirements.

Table 1 Major Farm Bill conservation programs that can be used to promote pollinators on working lands. All programs are voluntary. See the NRCS Web site for more information (http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/farmbill/), and visit the USDA service center locator to find USDA offices that administer these programs (http://offices.sc.egov.usda.gov/locator/app).

Program	Purpose	Land Eligibility	Type of Assistance
Environmental Quality Incentives Program (EQIP)	Promotes agricultural production and environmental quality as compatible national goals by helping eligible participants install or implement structural and management practices.	Land on which agricultural commodities, livestock, or forest-related products are produced.	EQIP provides financial and technical assistance to eligible producers to help offset the cost of implementation of NRCS-approved conservation practices. Payment rates developed each fiscal year are based on the estimated incurred cost and potential income foregone resulting from practice implementation. The 2014 Act eliminated the WHIP program but incorporated WHIP priorities into EQIP including a requirement that at least 5% of available financial assistance funds be targeted to development of wildlife habitat, which includes pollinators. Contact NRCS State or local office: http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/eqip/
Conservation Reserve Program (CRP)	Land retirement program that encourages farmers to convert highly erodible cropland or other environmentally sensitive acreage to vegetative cover, such as tame or native grasses, wildlife plantings, trees, filter strips, or riparian buffers. Addresses issues raised by State, regional, and national conservation initiatives.	Highly erodible land, wetland, streamside areas in pasture land, certain other lands. Eligible wetlands must have been cropped 3 of 10 previous years; highly erodible cropland 4 of 6 previous years.	50% cost-share for establishing permanent cover and conservation practices, and annual rental payments for land enrolled in 10- to 15-year contracts. Additional financial incentives are available for some practices. CRP is administered by FSA. NRCS provides conservation planning and supports practice implementation. Contact NRCS or FSA State or local office: http://www.fsa.usda.gov/programs-and-services/conservation-programs/index
Conservation Reserve Enhancement Program (CREP)	Land retirement program that helps agricultural producers protect environmentally sensitive land, decrease erosion, restore wildlife habitat, and safeguard ground and surface water. An offshoot of CRP, CREP emphasizes partnerships among State, Tribal, or local governments, private groups, and the USDA.	Lands that address an agriculture-related environmental issue of State or national significance, such as impacts to water supplies, loss of critical habitat for threatened and endangered wildlife species, soil erosion, and reduced habitat for fish populations, such as salmon. Enrollment in a State is limited to specific geographic areas and practices.	Annual payment plus cost-share of up to 50% of the eligible costs to install the practice. CREP contracts require a 10- to 15-year commitment to keep lands out of agricultural production. CREP is administered by FSA. NRCS provides technical assistance. Contact NRCS or FSA State or local office: http://www.fsa.usda.gov/programs-and-services/conservation-programs/index

Program	Purpose	Land Eligibility	Type of Assistance
Conservation Stewardship Program (CSP)	Encourage producers to address priority resource concerns and improve and conserve the quality and condition of natural resources in a comprehensive manner by— • Undertaking additional conservation activities; and • Improving, maintaining and managing existing conservation activities.	All of the eligible land on an applicant's agricultural operation where eligible land means— • Private and Tribal land on which agricultural commodities, livestock, or forest-related products are produced; and • Land upon which priority resource concerns could be addressed through a contract under the program. • Eligible land includes cropland, grassland, rangeland, pastureland, nonindustrial private forest land, and other agricultural lands including cropped woodland, marshes, and agricultural land used or capable of being used for the production of livestock as determined by the Chief of NRCS.	Annual payments to compensate a participant for installing and adopting additional conservation activities, and improving, maintaining, and managing existing conservation activities across the entire agricultural operation in a manner that increases or extends the conservation benefits in place at the time the contract offer is accepted by NRCS. Supplemental payments to a participant receiving annual payments, who also agrees to adopt or improve a resource-conserving crop rotation as defined by NRCS to achieve beneficial crop rotations as appropriate for the eligible land of the participant 5-year contracts renewable for another 5 years. Contact NRCS State or local office: http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/csp/
Agricultural Conservation Easement Program (ACEP)	ACEP is a new easement program introduced in the 2014 Farm Bill. It replaces the Wetlands Reserve Program, Grassland Reserve Program, and Farm and Ranch Land Protection Program. ACEP helps prevent agriculture working land conversion to nonfarm activities. It also encompasses restoration, protection, and enhancement of wetlands on agricultural lands.	Land in production for crops, grazing, or private forests is eligible for the agricultural land easements. Wetlands that have been converted to agricultural purposes but which could be effectively restored are eligible for the wetland reserve easements.	For agricultural land easements, NRCS contributes up to 50% financial assistance; up to 75% on grasslands of special environmental significance. For wetland easements, NRCS may pay 100% of the value for a permanent easement and 75% for 30-year easements. NRCS can also help with costs associated with recording the easement. Additionally, NRCS may pay between 75–100% of the restoration costs on a permanent easement; and 50–75% of the restoration costs on a 30-year easement. Contact NRCS State or local office: http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/easements/acep/

Table 2. Conservation practice standards that can be used under the EQIP program to create or enhance pollinator habitat and support predators and parasitoids of crop pests.

Conservation Practice Standard Name (units)	Code	Pollinator Notes
Alley Cropping (acres)	311	Can include trees or shrubs for producing wood or tree products in addition to agronomic crops (e.g., black locust (*Robinia pseudoacacia*), *Rubus* spp., etc.), vines, or row covers (e.g., various legumes, buckwheat, etc.) that provide nectar or pollen in addition to improving crop or forage quality and reducing runoff. NOTE: Black locust should be used with care because it is invasive in certain habitats outside of its natural range.
Conservation Cover (acres)	327	Permanent plantings can include diverse native and nonnative forbs to increase plant diversity and ensure flowers are in bloom for as long as possible, providing nectar and pollen throughout the growing season.
Conservation Crop Rotation (acres)	328	Cover crops used during conservation crop rotations can include forbs (e.g., various legumes, buckwheat (*Fagopyrum* spp.), phacelia (*Phacelia* spp.), etc.) that provide abundant forage for honey bees, native bees, and other pollinators. Insecticides should not be applied to these cover crops. Moving insect-pollinated crops no more than 800 feet during the rotation may help maintain local populations of native bees that have become established because of a specific crop or cover crop.
Contour Buffer Strips (acres)	332	Can include diverse legumes or other forbs that provide pollen and nectar for bees. In addition, mowing only every 2 or 3 years to benefit wildlife also will benefit nesting bumble bees. To protect bumble bee nests, mowing should occur in the late fall when colonies have died for the year and queens are overwintering.
Cover Crop (acres)	340	Can include diverse legumes, other forbs, and diverse or single species plantings that provide pollen and nectar for honey bees and native bees. Cover cropping can include planting blocks of a single species (e.g., crimson clover) designed to provide short-term but abundant bloom, multiple blocks of single species, or a diverse mix of species that provide a sequence of bloom throughout the year. A set of covers with sequential blooms could include clover (*Trifolium* spp.), phacelia (*Phacelia tanacetifolia*), buckwheat (*Fagopyrum esculentum*), and sunflower (*Helianthus* spp.). Many "beneficial insect" cover crop blends include plant species that will also provide forage for pollinators.
Critical Area Planting (acres)	342	Can include bunch grasses and flowering forbs, shrubs, or trees that provide abundant pollen and nectar for native bees and other pollinators, while also helping to prevent erosion on steep slopes. Planted areas may support stable soil for ground-nesting solitary bees, shrubs, or trees for cavity-nesting species, or dense vegetation under which bumble bees may hibernate or nest.
Early Successional Habitat Development/Management (acres)	647	This management practice is important for maintaining open and sunny habitat for pollinators. NOTE: To minimize damage to pollinator populations, disturbance practices should be implemented only every 2 to 3 years in rotation and, ideally, on only 30% or less of the overall site. This allows for habitat heterogeneity and opportunities for recolonization of nontreated habitat. For example, managers could mow or burn a small portion of the habitat (less than 1/3 of the site each year or two) on a 3- to 6-year cycle, or 1/5 of the site each year on a 5-year cycle. Avoid disturbance when pollinators are most active or during ground-nesting bird season. For details, see The Xerces Society publication "Pollinators in Natural Areas: A Primer on Habitat Management." (http://www.xerces.org/wp-content/uploads/2008/11/pollinators_in_natural_areas_xerces_society.pdf)

Conservation Practice Standard Name (units)	Code	Pollinator Notes
Field Border (feet)	386	Can include diverse legumes or other forbs that provide pollen and nectar for bees. Strive for a mix of forbs, vines, and shrubs that come into bloom at different times throughout the year. Site management (for example, mowing) should occur in the late fall to minimize impacts on pollen and nectar sources used by pollinators. Alternatively, allowing field borders to become overgrown may provide nesting habitat for bumble bees, as well as abundant forage. Stable (untilled) field borders may provide opportunities for solitary bees to nest in the soil. Field borders planted as pollinator habitat must be protected from pesticide drift from adjacent crops.
Filter Strip (acres)	393	Can include legumes or other forbs that provide pollen and nectar for native bees. Plant a diverse mix of cover crops that provide a sequence of bloom throughout the year. Site management (for example, mowing or burning) should occur in late fall to early spring to minimize impacts on pollinators. Filter strips should not be in bloom when pesticides may drift onto the habitat. Mowing prior to pesticide use in adjacent crops will lessen potential negative impacts for pollinators.
Grassed Waterway (acres)	412	Can include diverse legumes or other forbs that provide pollen and nectar for bees. In dry regions, these sites may be able to support flowering forbs with higher water requirements and thus provide bloom later in the summer.
Hedgerow Planting (feet)	422	Can include forbs, vines, shrubs, and small trees that provide pollen and nectar for bees. Ideally, plant a diverse mix to provide a sequence of bloom throughout the year. Bee nesting habitat may be created by including plants with pithy stems, such as sumac and elderberry, or ensuring there are some areas of untilled, semi-bare ground. Bumble bees may nest in unmowed grasses planted along the edge of the hedgerow. If designed with plants that do not attract pollinators at the time crops are sprayed, this practice also can help reduce the drift of pesticides into areas of pollinator habitat by capturing pesticide particulates. Hedgerows can also provide additional sources of income (fruit, nuts, wood, cut flowers, etc.).
Herbaceous Weed Control (acres)	315	Can be used in combination with other practices for weed abatement prior to planting for practices such as Conservation Cover or Hedgerow.
Herbaceous Wind Barriers (feet)	603	Can include diverse perennial or annual forbs that provide pollen and nectar for bees. Plant a diverse mix to provide a sequence of blooms throughout the year.
Integrated Pest Management (acres)	595	In general, implementing integrated pest management (IPM) for a crop reduces the use and impact of pest control chemicals on pollinators. In addition, plant species commonly used in IPM to support beneficial insects that help manage pests also can support bees. Examples of these plants include: phacelia (*Phacelia* spp.), sunflowers (*Helianthus* spp.), buckwheat (*Fagopyrum esculentum* spp.), and yarrow (*Achillea* spp.). Guidance on conservation practices and IPM strategies that help reduce risks to pollinators is available in Title 190, Agronomy Technical Note No. 9, "Preventing or Mitigating Potential Negative Impacts of Pesticides on Pollinators Using Integrated Pest Management and Other Conservation Practices" (Feb. 2014).
Multistory Cropping (acres)	379	Plantings consisting of an overstory of trees or shrubs with an understory of specialty or agronomic crops or forage can include woody plants carefully chosen to supply pollen and nectar for pollinators throughout the growing season, as well as nesting habitat for cavity-nesting bees.
Forage and Biomass Planting (acres)	512	Can include diverse legumes (e.g., alfalfa or various clovers) or other forbs that, when in bloom, provide pollen and nectar for bees.

Conservation Practice Standard Name (units)	Code	Pollinator Notes
Prescribed Burning (acres)	338	Can greatly benefit pollinators by maintaining a diverse mix of open, early successional habitat in various stages of maturity. NOTE: It is best if— • Only 30% or less of a site is burned at any one time to allow for recolonization by pollinators and other beneficial insects from adjacent habitat. • Burning occurs only every 3 to 6 years. • Burning occurs when pollinators are least active, such as when most plants have senesced, in fall, winter, or early spring. The timing of burns can also be used to manipulate the local plant community. Depending on the season, burning can suppress or promote forbs, cool-season grasses, warm-season grasses, or woody plants. Where the primary aim of management is to support butterfly species, prescribed burning may not be the best tool.
Prescribed Grazing (acres)	528	Can help maintain early successional habitat and its associated flowering plants. Ensure that grazing objectives include a diverse plant community that incorporates legumes, forbs, and appropriate flowering woody species to create floral and structural diversity. The natural foraging preferences of livestock can be used to manipulate the local plant community. For example, at moderate-to-low-stocking rates cattle will preferentially consume grass, giving forbs a competitive advantage.
Range Planting (acres)	550	Can include diverse legumes, other forbs and shrubs that provide pollen and nectar for bees. This practice is typically used when the wildflower seed bank has been depleted in a range setting.
Residue and Tillage Management, No-Till/Strip Till/Direct Seed (acres)	329	Can protect bees that are nesting in the ground at the base of the plants they pollinate. Tillage can destroy or block emergence from these nests (located 0.5 to 3 feet underground) of new adult bees bred the preceding year.
Restoration and Management of Rare and Declining Habitats (acres)	643	Can be used to provide diverse locally grown native forage (forbs, shrubs, vines, and trees) and nesting resources for pollinators. Many specialist pollinators that are closely tied to rare plants or habitats may significantly benefit from efforts to protect rare habitat. Certain rare plants require pollinators to reproduce. NOTE: Pollinator plants should only be planted if they were part of the rare ecosystem you are trying to restore.
Riparian Forest Buffer (acres)	391	Can include trees, shrubs, and forbs especially chosen to provide pollen and nectar for pollinators. These areas can be especially important in mid-summer if drought reduces the availability of pollen and nectar sources in upland sites. The stable habitat may supply nest sites to solitary ground- and wood-tunnel-nesting bees, as well as bumble bees. This practice also can help reduce drift of pesticides onto areas of pollinator habitat.
Riparian Herbaceous Cover (acres)	390	Can include diverse forbs that provide pollen and nectar for native bees. Many forbs of riparian areas flower in summer to fall, when pollinator forage is needed most.
Silvopasture Establishment (acres)	381	If grazing intensity is low enough to allow for plants to flower, this practice can include legumes and other forbs that provide pollen and nectar for bees. Trees and shrubs that provide pollen and nectar also can be planted. Reduced canopy cover tends to increase forb abundance and flowering, so thinning a stand to enhance or establish forage can be beneficial for bee habitat.
Stream Habitat Improvement and Management (acres)	395	Plants chosen for riparian habitat improvement can include trees, shrubs, and forbs that provide pollen and nectar for pollinators. Maximizing plant diversity along riparian corridors will result in more pollinators and other terrestrial insects to feed fish in the waterways.
Stream bank and Shoreline Protection (feet)	580	If vegetation is used for stream bank protection, plants can include trees, shrubs, and forbs especially chosen to provide pollen and nectar for pollinators. Good candidates include willow (*Salix* spp.), shrub dogwood (*Cornus* spp.) and goldenrod (*Solidago* or *Euthamia* spp.).

Conservation Practice Standard Name (units)	Code	Pollinator Notes
Strip-cropping (acres)	585	Can include diverse legumes or other forbs that provide pollen and nectar for bees. If insect-pollinated crops are grown, plants used in adjacent strips of vegetative cover may be carefully chosen to provide a complementary bloom period to the crop, such that the flowering period is extended.
Structures for Wildlife	649	New (2014) national conservation practice that includes all types of nesting structures or wildlife friendly retrofits. Can include structures for nesting habitat, such as nesting blocks, cut bamboo bundles, etc.
Tree/Shrub Establishment (acres)	612	Can include trees, shrubs, and vines especially chosen to provide pollen and nectar for pollinators. Woody plants with pithy stems (e.g., elderberry (*Sambucus* spp.), box elder (*Acer negundo*), and raspberries (*Rubus* spp.)) also may be chosen to provide potential nest sites for solitary bees that nest in woody stems.
Upland Wildlife Habitat Management (acres)	645	Can include managing for pollinator forage or pollinator nest sites, such as including nest blocks or snags for solitary bees that nest in tunnels in wood, access to bare soil for ground-nesting solitary bees, and small mammal burrows or overgrown grass cover for bumble bees. NOTE: See Early Successional Habitat Development/Management (647) and Prescribed Burning (338) for management techniques that minimize the disruption of pollinator communities.
Vegetative Barriers (feet)	601	Permanent strips of stiff, dense vegetation established along the general contour of slopes or across concentrated flow areas. Can include plants that provide pollen and nectar for pollinators.
Wetland Creation (acres)	658	Can include stable soil as nesting substrate in more upland areas, as well as plants that provide pollen and nectar for native bees and other pollinators. Plant genera of high value to pollinators that also have obligate or facultative wetland species include: *Asclepias, Bidens, Cephalanthus, Cornus, Crataegus, Epilobium, Eupatorium, Helianthus, Hibiscus, Hypericum, Iris, Juncus, Ledum, Lobelia, Ludwigia, Lysimachia, Mimulus, Ranunculus, Rhexia, Rhododendron, Ribes, Rosa, Rubus, Rudbeckia, Salix, Solidago, Spiraea*, and *Vaccinium*. Look for appropriate wetland plants from these and other genera for your region.
Wetland Enhancement (acres)	659	Wetland and adjacent upland can include trees, shrubs, and forbs especially chosen to provide pollen and nectar for pollinators. Snags can be protected or nest blocks for bees erected.
Wetland Restoration (acres)	657	Wetland and adjacent upland can include trees, shrubs, and forbs especially chosen to provide pollen and nectar for pollinators. Snags can be protected or nest blocks for bees erected.
Wetland Wildlife Habitat Management (acres)	644	Wetland and adjacent upland can include trees, shrubs, and forbs especially chosen to provide pollen and nectar for pollinators. Snags can be protected or nest blocks for bees erected. NOTE: See Early Successional Habitat Development/Management (647) and Prescribed Burning (338) for management techniques that minimize the disruption of pollinator communities.
Windbreak/Shelterbelt Establishment (feet)	380	Can include trees, shrubs, vines, and forbs especially chosen to provide pollen and nectar for pollinators. Windbreaks and shelter belts are a good place to put nesting structures for native bees, and they can help reduce drift of insecticides onto a site. Guidance on establishing pesticide barriers can be found in "Designed with pollinators in mind." Windbreaks: These aren't your grandfather's shelterbelts, *Inside Agroforestry*, Volume 20, Issue 1. (http://nac.unl.edu/publications/insideagroforestry.htm)
Windbreak/Shelterbelt Renovation (feet)	650	Can include trees, shrubs, vines, and forbs especially chosen to provide pollen and nectar for pollinators. If appropriate, dead trees and snags may be kept or drilled with holes to provide nesting sites for bees. Can also be used to create drift barriers to protect habitat from pesticide drift, or reduce offsite drift. See guidance for Windbreak/Shelterbelt Establishment (380).

Table 3. Pollinator requirements and the conservation practice standards that support them in the field

Pollinator Resource	Code and Conservation Practice Standard Name (units)
Forage (diverse sources of pollen and nectar that support pollinators, predators, and parasitoids throughout the growing season)	311 – Alley Cropping (acres) 327 – Conservation Cover (acres) 328 – Conservation Crop Rotation (acres) 656 – Constructed Wetland (acres) 332 – Contour Buffer Strips (acres) 340 – Cover Crop (acres) 342 – Critical Area Planting (acres) 386 – Field Border (feet) 393 – Filter Strip (acres) 412 – Grassed Waterway (acres) 422 – Hedgerow Planting (feet) 315 – Herbaceous Weed Control (acres) 603 – Herbaceous Wind Barriers (feet) 595 – Integrated Pest Management (acres) 379 – Multi-Story Cropping (acres) 512 – Forage and Biomass Planting (acres) 528 – Prescribed Grazing (acres) 550 – Range Planting (acres) 643 – Restoration and Management of Rare and Declining Habitats (acres) 391 – Riparian Forest Buffer (acres) 390 – Riparian Herbaceous Cover (acres) 381 – Silvopasture Establishment (acres) 395 – Stream Habitat Improvement and Management (acres 580 – Stream bank and Shoreline Protection (feet) 585 – Strip-cropping (acres) 612 – Tree/Shrub Establishment (acres) 645 – Upland Wildlife Habitat Management (acres) 601 – Vegetative Barriers (feet) 659 – Wetland Enhancement (acres) 657 – Wetland Restoration (acres) 644 – Wetland Wildlife Habitat Management (acres) 380 – Windbreak/Shelterbelt Establishment (feet) 650 – Windbreak/Shelterbelt Renovation (feet)

Pollinator Resource	Code and Conservation Practice Standard Name (units)
Nest sites (stable ground, holes in wood, native bunch grasses or cavities for bumble bees, or overwintering sites for bumble bee queens and other beneficial insects)	656 – Constructed Wetland (acres) 332 – Contour Buffer Strips (acres) 342 – Critical Area Planting (acres) 386 – Field Border (feet) 422 – Hedgerow Planting (feet) 409 – Prescribed Forestry (acres) 329 – Residue & Tillage Management, No-Till/Strip Till/Direct Seed (acres) 643 – Restoration and Management of Rare and Declining Habitats (acres) 391 – Riparian Forest Buffer (acres) 649 – Structures for Wildlife 612 – Tree/Shrub Establishment (acres) 645 – Upland Wildlife Habitat Management (acres) 659 – Wetland Enhancement (acres) 657 – Wetland Restoration (acres) 644 – Wetland Wildlife Habitat Management (acres) 380 – Windbreak/Shelterbelt Establishment (feet) 650 – Windbreak/Shelterbelt Renovation (feet)
Pesticide protection (refuge from spray, buffers to drift, etc.)	322 – Channel Bank Vegetation (acres) 656 – Constructed Wetland (acres) 342 – Critical Area Planting (acres) 422 – Hedgerow Planting (feet) 595 – Integrated Pest Management (acres) 391 – Riparian Forest Buffer (acres) 657 - Wetland Restoration (acres) 380 - Windbreak/Shelterbelt Establishment (feet)
Site management for pollinators	647 – Early Successional Habitat Development or Management (acres) 595 – Integrated Pest Management (acres) 338 – Prescribed Burning (acres) 528 – Prescribed Grazing (acres) 643 – Restoration and Management of Rare and Declining Habitats (acres) 645 – Upland Wildlife Habitat Management (acres) 644 – Wetland Wildlife Habitat Management (acres)

Conservation Reserve Program, Pollinator Practices

Table 4 lists conservation practices commonly used to improve pollinator habitat, either through establishing new habitat or improving existing sites by adding more pollinator plants. The column labeled "Notes" lists how these CRP enhancements can support pollinators.

Table 4. CRP enhancements that can be used to improve pollinator habitat

Code	Practice Name	Notes
Practices to create pollinator habitat		
CP2	Native grasses	Can include pollinator forbs or legumes
CP4D	Permanent wildlife habitat	Can include high percentage of forbs or legumes
CP42	Pollinator habitat	Used to contract permanent high-value pollinator wildflower seed mixes
Practices that can include pollinator plants		
CP3A	Hardwood trees	Can include pollinator trees[1]
CP4B	Wildlife habitat corridor	Can include high percentage of forbs or legumes
CP12	Wildlife food plot	Can include pollinator forbs or legumes
CP22	Riparian buffer	Can include high percentage of forbs or legumes
CP23	Wetland restoration	Can include high percentage of forbs or legumes
CP25	Rare and declining habitat	Can include high percentage of forbs or legumes
CP29	Wildlife habitat buffer (marg. pasture)	Can include high percentage of forbs or legumes
CP30	Wetland buffer (marg. pasture)	Can include high percentage of forbs or legumes
CP31	Bottomland hardwood trees	Can include pollinator trees
CP32	Hardwood trees (previous expired)	Can include pollinator trees
CP33	Upland bird habitat buffer	Can include high percentage of forbs or legumes
CP41	Flooded prairie wetland (FWP)	Can include high percentage of forbs or legumes

[1]Pollinator trees produce high-quality pollen, nectar, or both that support native bees and honey bees, or have pithy stems that provide nesting sites for cavity-nesting bees.

Conservation Stewardship Program, pollinator enhancements

CSP includes many enhancements that may be contracted to conserve pollinators. Current enhancements, such as pollinator and/or beneficial insect habitat (PLT15), provide additional incentives for incorporation of pollinator habitat into CSP contracts. Other enhancements, such as grazing management to improve wildlife habitat (ANM09); prairie restoration for grazing and wildlife habitat (ANM21); and renovation of windbreak, shelterbelt, or hedgerow for wildlife (PLT06) may target other resource concerns, but can be designed to include nectar and pollen resources for bees and other pollinators. In addition, in fiscal year 2015, a new national supplement to PLT15 was developed for the monarch butterfly to aid in the conservation of this species. In fiscal year 2016, a new enhancement for monarch butterfly habitat establishment will be available.

Agricultural Conservation Easement Program, pollinator conservation opportunities

During the restoration planning process for conservation easements, there are many opportunities to incorporate the habitat needs of pollinators. Diverse pollinator-friendly native wildflowers, shrubs and trees, milkweed, and other butterfly host plants, and nesting structures, such as brush piles, are all compatible with ACEP restoration projects. In the past few years, for example, some States have included pollinator habitat as a goal for all WRP restoration projects, which under the 2014 Farm Bill are part of ACEP.

Figure 1 Common eastern bumble bee pollinating a tomato

Photo by Nancy Adamson, Xerces Society

State-Level Opportunities

Pollinator conservation biology technical notes

Each State can develop pollinator conservation biology technical notes to help field conservationists promote pollinators in their conservation planning and implementation. Ideally, the notes will—

- Emphasize the importance of leaving as much land as possible undisturbed and in relatively natural condition since many pollinators require this for successful completion of their life cycles.
- Provide details on the native and nonnative plants used by honey bees, native bees, or other pollinators, such as butterflies, that could be included in various conservation practices throughout the State. Important information to include for each plant is—
    - Flowering period.
    - Suitable habitat conditions for planting.
    - Information on seeding rates.
    - Site preparation.
    - Seeding methods.
    - Timing.
- Stress the importance of having multiple species of flower in bloom throughout the growing seasons. In practice, this means providing at least three blooming pollinator plants during each season: spring, summer, and fall (and winter in some southern regions).
- Highlight the importance of nest sites for crop-pollinating native bees. These nest sites include—
    - Partially bare, well-drained ground for solitary ground-nesting bees.
    - Plants with pithy stems or tunnels in standing dead wood for solitary cavity-nesting bees.

- Small cavities or areas of overgrown, fallen grass (where abandoned rodent burrows may be found) for bumble bees.
- Narrow tunnels in standing dead wood or plants with pithy stems for solitary tunnel-nesting bees.
- Small cavities, such as abandoned rodent burrows or areas of overgrown, fallen grass for bumble bees.

- Emphasize the value of added diversity for other wildlife, for ecosystem stability, and for ensuring successful pollination when one or more pollinator species declines in one season or over a longer period. Increased plant diversity leads to higher insect diversity and better nutrition for birds and other wildlife.
- Emphasize the value of diverse niche habitats in supporting and providing refuge for other beneficial arthropods that help reduce crop pest problems. Arthropods beneficial for agriculture include spiders, predatory wasps, beetles, bugs, lacewings, and parasitic wasps, flies, and beetles.
- Emphasize the value of improved plant health by maintaining healthy soil flora with reduced use of pesticides and herbicides when managing for pollinators and other beneficial arthropods.
- Encourage use of a variety of strategies, from wildflower meadows to cover crops, forage legumes, and hedgerows, along with managed grazing or burning, to encourage landowners to take actions that fit their budget and landscape.

Many NRCS State offices have produced pollinator conservation biology technical notes, and others are in the making. To find technical notes for your State, check your State's Field Office Technical Guide, contact your State biologist, or look for examples on the table of NRCS pollinator conservation technical documents found at http://plants.usda.gov/pollinators/NRCSdocuments.html. If your State doesn't have such guidance, consider looking at examples from nearby States.

Other State and national guidance documents include plant lists, habitat installation guides, habitat assessment guides, integrated pest management technical notes, webinars, and more. Pollinator Conservation Job Sheets aid in contracting pollinator conservation projects. Many States have developed job sheets, implementation requirements, or other tools to help conservation planners work with their clients on project design. These planning guides usually provide general criteria and specifications, details on site maintenance, lists of appropriate plants, and tools for site planning. Many examples are available from across the United States, and they can be adapted by any State office technical staff to meet the needs of that State.

Most of the available NRCS technical resources are categorized and linked on line at the following Web address: http://plants.usda.gov/pollinators/NRCSdocuments.html. Here you will find NRCS pollinator conservation guidance organized by region, State, and type of resource. This Web site provides conservation practitioners, agency personnel, and others a quick index of available information for their own and neighboring States.

Conservation Activity Plans

State offices also can choose to offer landowners the opportunity to apply for funding to pay a technical service provider to supply guidance under the EQIP conservation practice conservation activity plan (CAP). CAPs address specific conservation needs, including pollinator habitat enhancement (CAP 146). To be most useful, completed CAPs

Figure 2 Fire can be used in many settings to encourage forbs that feed and shelter pollinators

Photo by Jeff Vanaga, USDA NRCS

for pollinators should provide a pollinator habitat assessment, farm-specific suggestions for habitat improvements, and recommendations for adjusting farm management practices to reduce negative impacts to bees and other pollinators. CAPs also should provide information on financial assistance opportunities.

The first step in obtaining a CAP for pollinator habitat enhancement is to request a conservation plan from your local NRCS service center. More information on CAPs and links to each State's EQIP page listing ranking criteria, priority resource concerns, and eligible conservation practices, can be found on NRCS's CAP page for the current fiscal year. Other CAPs that can be used to plan for improving pollinator habitat include Forest Management (106), Integrated Pest Management (114), Organic Transition or Organic Cropland (138), and Fish and Wildlife Habitat Management (142).

Payment scenarios for pollinator conservation

Many pollinator conservation projects require the use of more expensive native plant materials. For example, milkweed seed is relatively expensive when compared to other native seed, and including it in pollinator seed mixes can increase the price of a high-value native seed mix. In addition, for practices like wildflower meadows, it is important to adequately prepare the site prior to planting. This requires aggressive weed abatement during the growing season prior to planting. The higher costs of these practices should be considered when developing payment scenarios for pollinator practices contracted under Conservation Cover (327) or Herbaceous Weed Control (315), for example.

Other State Opportunities

NRCS State programs can add pollinator habitat criteria to their existing Wildlife Habitat Evaluation Guides, or develop specific documents that assess pollinator habitat. They can also incorporate information on pollinators into their State vegetation guides. To see an example of a Pollinator Habitat Evaluation Guide, The Xerces Society has developed a general template for agricultural landscapes (http://www.xerces.org/wp-content/uploads/2009/11/PollinatorHabitatAssessment.pdf), as well as for rangelands and natural areas. (http://www.xerces.org/wp-content/uploads/2014/12/PollinatorHabitatAssessment_NaturalAreasRangelands_web.pdf).

Plant materials center assistance

Regional NRCS plant materials centers (PMCs) and plant material specialists are conducting field trials on pollinator plantings and seed mixes, helping to bring new and important plant materials, such as milkweed, into production. PMCs are a critical resource for supporting field office staff and growers in developing and implementing pollinator conservation projects. PMC staff can work with States to produce regional pollinator conservation biology technical notes and other documents, or refine existing pollinator plant lists and guidelines. For information on the NRCS Plant Materials Program and publications, visit http://www.nrcs.usda.gov/wps/portal/nrcs/site/plantmaterials/home/.

State office assistance

The NRCS national technology support centers (NTSC) and several private foundations fund the Xerces Society to provide NRCS State offices with technical support to help implement pollinator conservation measures. NRCS State offices are welcome to contact your regional NTSC or Mace Vaughan (mace.vaughan@por.usda.gov) if you are interested in this service.

For more information about pollinator conservation measures, please see:

NRCS "How NRCS is Helping Pollinators" Web page:

http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/plantsanimals/pollinate/.

NRCS technical documents and online trainings developed to support pollinator conservation efforts:

http://plants.usda.gov/pollinators/NRCSdocuments.html.

http://www.nrcs.usda.gov/wps/portal/nrcs/rpublications/plantmaterials/technical/publications/?ptype=PL.

Xerces Society Pollinator Conservation Resource Center:

http://www.xerces.org/pollinator-resource-center/.