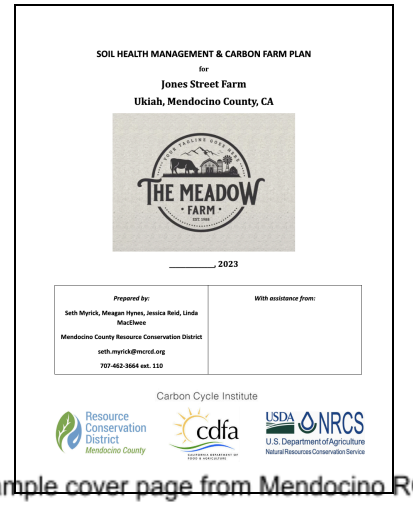
Pollinator DIA 148 Outline



Example cover page from Mendocino RCD for CFP and Soil Health Management Plan

I. Cover page
   - A. TAP name and contact information
   - B. Farm
   - C. DIA name and number
   - D. Date
   - E. Logos of relevant funders and RCD

II. Table of contents

III. What is a pollinator habitat plan?

IV. Site description
   - A. History of current farm management
   - B. History of prior land management (if known)
   - C. Property and operations description
   - D. Regional Climate
   - E. Site location maps

V. Resource concerns

VI. Goals for pollinator habitat
   - A. Target species, pests, crops, etc.

VII. Plans and specifications
   - A. List one conservation practice (common practices listed in pollinator habitat SOP)
   - B. Review implementation requirements listed for the California-specific conservation practice standard in EFOTG database
   - C. Consider using the Calscape planning tool for plant selection
   - D. Use the implementation requirements for your selected practice to write instructions for implementation on the farm. These instructions should include:
      1. At least all items listed in the “Plans and Specifications” section of the NRCS conservation practice standard document for the selected practice
      2. A species list and the estimated flowering season for each of the pollinator-friendly forage plant species
      3. Pesticides used that may pose a hazard to pollinators
      4. If providing crop pollination services, record the crops to be pollinated
      5. Monitoring plan
         a) Good option: Xerces Society’s Streamlined Monitoring Protocol for Assessing Pollinator Habitat
         b) Identify dates and data to be recorded
   - E. If developing pest management strategy, Western IPM has data and strategies

VIII. Design
   - A. Consult the EFOTG database for practice specifications and implementation requirements– these documents will provide design guidance.
   - B. Annotated map showing the area for implementation

IX. Timeline
   - A. Timeline for finding vendors/contractors, planting, and monitoring.

X. Funding considerations

XI. References or appendix maps, tech notes
   - A. Include survey notes from the field visit as tech notes

Pollinator Habitat Design and Implementation Activity (DIA 148)

for

[INSERT FARM NAME]
City, County, CA

[FARM LOGO]

Month, year

Prepared by: *Planner names* *Organization* *Email* *Phone number*	*With assistance from:*

Landowner Acceptance Statement and Signature:
I accept the completed DIA deliverables as thorough and satisfying my objectives.

Participant Signature _____ Date _____

Table of contents

What is a pollinator habitat plan?

Pollinators provide crucial ecosystem services to our natural and working lands by facilitating the production of fruits, seeds, and young plants. Approximately one-third of the world's food crops depend on animal pollinators to reproduce (USDA), which makes pollinator habitat a critical part of any functioning agricultural ecosystem. Planting pollinator habitat increases the availability of forage and shelter for beneficial species like bees, butterflies and moths, birds and bats, and beetles and other insects.

A pollinator habitat plan is a road map to increasing pollinator function and diversity on an operation. This plan provides design and implementation specifications for a specific, pollinator-focused conservation practice.

Site description

[Farm name] is a [crop] operation located in [City, County, State] in the [watershed (find here)]. The farm is managed for [perennial/annual] crops with a rotation of [crops that are rotated] on a [seasonal/annual/# of year] basis. Founded by... previously was… this many acres, of which this many acres are farmed… land use history… types of management across the property… the product is distributed where… certifications… irrigation… current conservation work… grower interests… etc.

The property is located near [notable geographic features] in the Sacramento Valley. Sacramento Valley agriculture relies on a combination of surface water and groundwater with groundwater accounting for less than 30% of the annual supply used for agriculture and urban purposes (California Department of Water Resources, 2003). This property primarily uses [ground/surface water]. This region has a mediterranean climate with warm summers and mild winters. The historical average maximum temperature in the Valley is 70.9ºF and the historical average minimum temperature is 43.5ºF with an average of 34.6 inches of precipitation during the same time period (1984–2004) (Cal-Adapt, 2018). This farm sits at an elevation of [elevation ft] and has prevailing winds from the [cardinal direction]. Models for the Sacramento Valley indicate that the most drastic effects on the Valley due to climate change will likely be increased average maximum and minimum temperatures, and intensifying drought (Cal-Adapt, 2018). Potential paths forward include planting more heat tolerant crop varieties when possible, reducing carbon and methane emissions through climate smart agriculture, and planting pollinator and wildlife habitat to maintain ecosystem biodiversity and crop success.

[Insert map of farm location in the region and closer aerial image of the farm extent with existing conservation practices overlaid]

Table 1. Existing Conservation Practices

Practice	Duration	Location	Acres/Linear ft	Funding

Resource concerns

Habitat loss, disease, parasites, and environmental contaminants negatively impact pollinator survival and their ability to perform valuable ecosystem services (USDA). The following table illustrates whether or not pollinator-related resource concerns were observed at this farm.

Table 2. Pollinator Habitat Resource Conditions and Concerns

Resource Concern	Observed	Not Observed	Undetermined	Location
Pesticides transported to surface water				
Pesticides transported to groundwater				
Plant productivity and health				
Terrestrial habitat for wildlife and invertebrates				

Goals for pollinator habitat

The following lists producer objectives for future pollinator habitat: *[Select from the list what items best represent producer goals]*

- Improve pollination service provided by wild bees
    - Increasing floral diversity and ensuring continuous and diverse bloom.
    - Increasing undisturbed habitat/ground (including the creation of alkali or other ground-nesting bee beds).
    - Increasing nesting opportunities for tunnel-nesting bees.
    - Providing pollinator refuge from insecticide exposure or other disturbance.
- Improve pollination service provided by managed bees
    - Increasing floral diversity and ensuring continuous and diverse bloom.

    - Providing readily accessible clean water.
- Increase diversity and availability of butterfly host plants.
- Increase abundance of beneficial insects important for pest management.
- Improve cost efficiency (e.g., removal of marginal crop land from production and/or improvement of produce quality from enhanced pollination).
- Maintain or improve wildlife habitat.
- Beautify the landscape.
- Provide pollinator populations with refuge from pesticides.
- Change or adjust pesticide use to reduce hazards for pollinator populations.

Plans and Specifications

To achieve the above listed goals and address pollinator-related resource concerns in this operation, the producer has elected to pursue [insert selected conservation practice].

Keep only the practice that has been selected for this plan

Conservation cover

Areas with no vegetation are at increased risk for soil erosion. Conservation cover can be planted where permanent vegetation is likely to conserve and stabilize soil. According to NRCS, this does not apply to forage plantings or to critical area plantings that require special measures to ensure successful establishment. Additionally, if the only purpose of the planting is to provide wildlife habitat, then use wildlife habitat planting guidance (NRCS CPS 420). This practice can be used to reduce erosion and sediment or nutrient transport to surface water, reduce emissions of particulate matter, provide wildlife, pollinator, and other beneficial organism habitat, and improve soil health. In this case, the impact to pollinator habitat is pertinent. This language is adopted from NRCS CPS 327.

[Insert farm name] has [#] suitable area(s) for conservation cover. This area is [#] acres and can be planted with [species] to conserve soil and provide pollinator beneficial insect habitat. This practice primarily addresses the identified goal of [farm goal].

Conservation crop rotation

Croplands with at least one annual crop are suitable for conservation crop rotation. This practice refers to the incorporation of multiple plant species into the annual crop rotation cycle. A rotation of crops reduces or eliminates bare soil or fallow fields. This improves soil health and builds organic matter, reduces erosion, increases soil moisture, and supports wildlife and pollinators. Pests, synthetic fertilizer needs, and salt or chemical build up can also be reduced. *Guidance language adopted from NRCS CPS 328.*

At [insert farm name] there were [#] acres in the area of the property that were frequently fallowed in the last 10 years (fallowed for at least three seasons). [#] acres of this land can be

addressed with a conservation crop rotation which would equate to [#] MT/year of CO_2e storage.

Table 8. Planned conservation crop rotations at [insert farm name].

Location	Acres	Sequence of crops	Purpose of crop rotation	Tillage

Cover crops

Cover crop and resident vegetation can be cultivated in both croplands and orchard systems to enhance ecosystem benefits and carbon sequestration. Cover crops are grasses, legumes, and other forbs planted for seasonal vegetative cover and can support one or more of the following purposes:

- Reduce sheet, rill, and wind erosion.
- Maintain or increase soil organic matter.
- Improve soil aggregate stability.
- Improve habitat for soil organisms.
- Reduce water quality degradation by utilizing excess soil nutrients.
- Reduce weed and plant pest pressure.
- Improve moisture management.
- Reduce soil compaction.
- Supply nitrogen to the subsequent crop.
- **Improve habitat for pollinators, beneficial organisms, or natural enemies of crop pests.**

Guidance language adopted from NRCS CPS 340.

Management factors like cover crop termination method and timing are also crucial in meeting identified goals. Producers may want to trial cover cropping on a smaller field or area before committing a whole field to transitioning into cover crop use.

[insert farm name] can plant cover crop in their croplands/orchard/vineyard to achieve the identified goals of [insert relevant goals]. Some areas may require different cover crop mixes year-to-year based on their crop rotations so further design and implementation plans are recommended when cover cropping is pursued. [Insert plans for equipment access. Will they need to contract this service?]

To meet pollinator habitat goals, [insert farm name] should plant a mix of X on their [insert location] during [season]. Termination is planned for [season] and will be completed using [termination method].

Hedgerow, windbreaks & shelterbelts

Hedgerows, windbreaks, and shelterbelts are an establishment of dense vegetation in a linear design to achieve a natural resource conservation purpose such as providing habitat for terrestrial wildlife, pollinators, and beneficial insects, reducing wind and drifting dust and noise, increasing carbon storage in biomass and soils, or boundary delineation (NRCS, CPS 422).

These listed purposes and additional co-benefits can be achieved at [Insert farm name] by planting woody species like trees and shrubs along [designate field margin]. This planting will help achieve the identified goals of [insert relevant goals]. The hedgerow will be approximately [length] and [width]. Species can include: [possible species list].

EXAMPLE:

Table 2. Proposed location and extent for new hedgerows and shelterbelts (shaded fuel breaks) along SPR crop fields

Proposed hedgerow/shelterbelt	Linear distance (ft)	Width (ft)	Area (ac)
Hedgerow – Mill Creek field	175	8	0.03
Hedgerow – Jacobs field	820	8	0.15
Shelterbelt – Swanton Rd	3,900	6	0.53
TOTAL			**0.71**

Rangeland Planting

Rangeland planting takes place where desirable rangeland vegetation is below the acceptable level for natural reseeding to take place, or where enhancement cannot be achieved through only the management of herbivory. This practice includes the seeding and establishment of both herbaceous and woody species to improve overall vegetation productivity and community. Purposes of rangeland planting include ecological restoration, improve forage and cover for wildlife and pollinators, reduce erosion, improve water quality and quantity, restore hydrologic function, and increase or stabilize carbon sequestration. Language adopted from NRCS CPS 550.

Rangeland planting can take place at [insert ranch name] in [field/area name] over [#] acres to meet identified goals of [insert goals]. A mix of [species] is recommended to achieve these goals.

Conservation Practice Design and Implementation

I. *Review selected practice implementation requirements listed for the California-specific conservation practice standard in EFOTG database*
II. ***Use the implementation requirements document for your selected practice to write instructions for implementation on the farm.*** *These instructions need to include:*
    A. *At least all items listed in the "Plans and Specifications" section of the NRCS conservation practice standard document for the selected practice*
    B. *A species list and the estimated flowering season for each of the pollinator-friendly forage plant species*
    C. *Pesticides used that may pose a hazard to pollinators*
    D. *If providing crop pollination services, record the crops to be pollinated*
III. ***Include an annotated map showing the area for implementation***

Monitoring Plan

Practice monitoring ([insert examples of practices] etc.) should be carried out in coordination with project managers from the NRCS or others involved in project implementation or monitoring, such as [RCD name]. Tools such as Point Blue's Crop-C or Range-C carbon monitoring systems may be of particular interest. Xerces Society also has guidance for monitoring the success of pollinator habitat which can be followed by farmers or technical assistance providers.

I. *Identify dates and data to be recorded*
II. *Identify who will be responsible for continual monitoring or care for the implemented practice*
III. *Good option: Xerces Society's Streamlined Monitoring Protocol for Assessing Pollinator Habitat*
IV. *Western IPM Center has good data and strategic plans for pest management if needed*

Co-benefits

In addition to improving pollinator habitat, [practice] has a number of additional benefits often referred to as "co-benefits". These include: *[select all that apply]*

- Carbon sequestration in woody biomass
- Protection from soil erosion
- Protection from wind erosion
- Improved soil health

Continuing the implementation of conservation practices on this kind of operation can help the success of pollinator habitats. Stacking these kinds of practices will cultivate a balanced, resilient, and lasting agricultural ecosystem.

Timeline

I. *Timeline for finding vendors/contractors, planting, and monitoring.*
   A. *Creating a Gantt chart can be a great visual aid to plan for future project management OR use the implementation table below*
   B. *Consider listing possible vendors/contractors and their quotes.*

Implementation for the practices outlined in the plan will be staggered to optimize meeting farmers goals and acquiring financial assistance through various funding sources. Cost is estimated at the time this plan was written (month, year) and should not be used in any official capacity. When possible, update estimated cost based on most recent material and labor costs.

Table X. General timeline for implementing various pollinator-beneficial practices. Some practices (or expansion of a practice) are dependent upon funding acquisition. Short-term implementation is either ongoing or planned to initiate in the next 1–2 years. Mid-term implementation will be initiated in 2–5 years. Long-term implementation will be initiated in 5–10 years from initial plan creation.

Practice	Short-term	Mid-term	Long-term	Additional notes & possible vendors for short-term implementation	Estimated cost	Implemented?
Cover crop	X			CDFA Healthy Soils Program funding is available Winter 20XX Possible vendors: Seed drill vendor A, seed drill vendor B.	$6,000 (source: e.g. UC Davis cost study)	Y/N

Funding considerations

I. *Indicate if implementation funds are included with this plan– if so, from where and when?*
II. *If implementation is not included use the following and include any additional programs that are relevant AND INCLUDE THEIR DEADLINES:*

Practices can be paid for by growers, or through various programs. The following list includes some but not all of the options for funding pollinator habitat in the State of California. Funding deadlines are variable, this plan attempts to capture the most up to date information at the time the plan is written.

Federal

Natural Resource Conservation Services Environmental Quality Incentives Program (EQIP)

This program provides financial and technical assistance to producers to address natural resource concerns and provide environmental benefits. This program typically assists agricultural producers with cost share related to many of the practices listed in this carbon farm plan (e.g. hedgerow planting, soil carbon amendment, cover crop). Contact your local NRCS office for more information.

[Insert contact info for local NRCS office]

https://www.nrcs.usda.gov/sites/default/files/2022-10/EQIP-fact-sheet.pdf

State

California Dept. of Food and Agriculture Healthy Soils Program

Apply directly to incentives program with CDFA or through awarded block grant recipients: Resource Conservation Districts, non-profit organizations, University of California, California State Universities, California community colleges, and California and federally recognized Tribes. Supported practices would include compost application, cover cropping, no-till, reduced-till, mulching, and hedgerow practices. A list of 2023 awardees can be found here. Contact your local RCD for more information.

[Insert contact info for local RCD office]

https://www.cdfa.ca.gov/oefi/healthysoils/IncentivesProgram.html

California Dept. of Food and Agriculture Pollinator Habitat Program

This program funds pollinator habitat implementation such as cover crops, hedgerow planting, integrated pest management, and more. Apply through awarded Resource Conservation Districts, non-profit organizations, University of California, California State Universities, California community colleges, and California and federally recognized Tribes. Contact your local RCD for more information.

[Insert contact info for local RCD office]

https://www.cdfa.ca.gov/oefi/php/

California Wildlife Conservation Board

The WCB has a number of wildlife habitat enhancement funding programs including the California Riparian Habitat Conservation Program (CRHCP), the Ecosystem Restoration on Agricultural Lands (ERAL), Monarch Butterfly and Pollinator Rescue Program. Depending on the purpose of a proposed practice, various programs may be utilized.

https://wcb.ca.gov/Programs

Private or non-profit

National Fish and Wildlife Foundation (NFWF) Monarch Butterfly and Pollinators Conservation Fund

Grants are awarded to projects that will create and sustain pollinator habitats. In 2023, grants ranged from $200,00-$250,000 for projects up to two years.

https://www.nfwf.org/programs/monarch-butterfly-and-pollinators-conservation-fund

Project Apis M. Seeds for Bees
Apply through Project Apis M.'s Seeds for Bees program for up to $2,500 in cover crop seed mix your first year, $1,500 your second year, and smaller discounts for all following years of cover cropping. Applications open April 1st each year.
https://www.projectapism.org/sign-up-for-seeds-for-bees-program

Western SARE Farmer/Rancher Grant
Producers may apply for up to $35,000 to work together with a technical advisor to develop a project (1-3 years in scope) that conducts both research and outreach on a sustainable agriculture topic. Requires outreach and possible on-farm demonstrations.
https://western.sare.org/grants/farmer-rancher/

The Xerces Society Monarch and Pollinator Habitat Kits
Provides habitat plant kits that contain climate-smart native plants with the goal to support monarchs and other local pollinators in California whose populations are in decline. This cost share opportunity could support the planned hedgerow components of this carbon farm plan but also riparian areas through a different kit specifically for riparian wildflower plantings.
https://xerces.org/pollinator-conservation/habitat-kits/california

Zero Foodprint Restore Grant
Provides funding for adopting practices aimed at sequestering atmospheric carbon in the soil. Maximum funding is $25,000 per round, with a lifetime maximum of $75,000 across multiple rounds.
https://www.zerofoodprint.org/

References

U.S. Department of Agriculture. (n.d.). The importance of pollinators. https://www.usda.gov/peoples-garden/pollinators

California Department of Water Resources. (2003). Sacramento Valley Groundwater Basin North American Subbasin. https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Bulletin-118/Files/2003-Basin-Descriptions/5_021_64_NorthAmericanSubbasin.pdf

Cal-Adapt. (2018). [Annual averages for Sacramento Valley, California's Fourth Assessment Climate Region, RCP 4.5, Global Climate Models HadGEM2-ES, CNRM-CM5, CanESM2, MIROC5]. Cal-Adapt website developed by University of California at Berkeley's Geospatial Innovation Facility under contract with the California Energy Commission. Retrieved [22 November 2024], from https://cal-adapt.org/tools/extreme-heat/.

Appendix

Include notes from the initial field survey with producer here.