

FY2024 Pivot for Pollinators Targeted Implementation Plan

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Figures 1.1 & 1.2 – Pollinator Planting and Center Pivot Irrigation Project (Photos courtesy USDA-NRCS).

TIP Summary

The quality and quantity of pollinator habitat has declined in recent decades in Big Horn County as a result of increased acres of flood irrigation and associated farming practices. Pollinator habitat is essential for successful farming and ranching. Research, combined with the Pollinator Habitat Evaluation Guide (PHEG), demonstrates that there is a significant improvement in pollinator habitat with the conversion of flood irrigation to sprinkler irrigation. Certain management practices can further improve the quality of pollinator habitat. This TIP will increase pollinator populations by implementing vegetative, irrigation, and management practices that benefit pollinator habitat. Implementation would occur during Fiscal Years 2024-2028 at the estimated cost of \$3,400,000.

The priority resource concern this TIP will address is:

- ***Terrestrial Habitat - Terrestrial Habitat for Wildlife and Invertebrates.***

The two secondary resource concerns this TIP will address are:

- ***Degraded Plant Condition – Plant Structure and Composition.***
- ***Soil Quality Limitations – Organic Matter Depletion.***

Geographic Focus

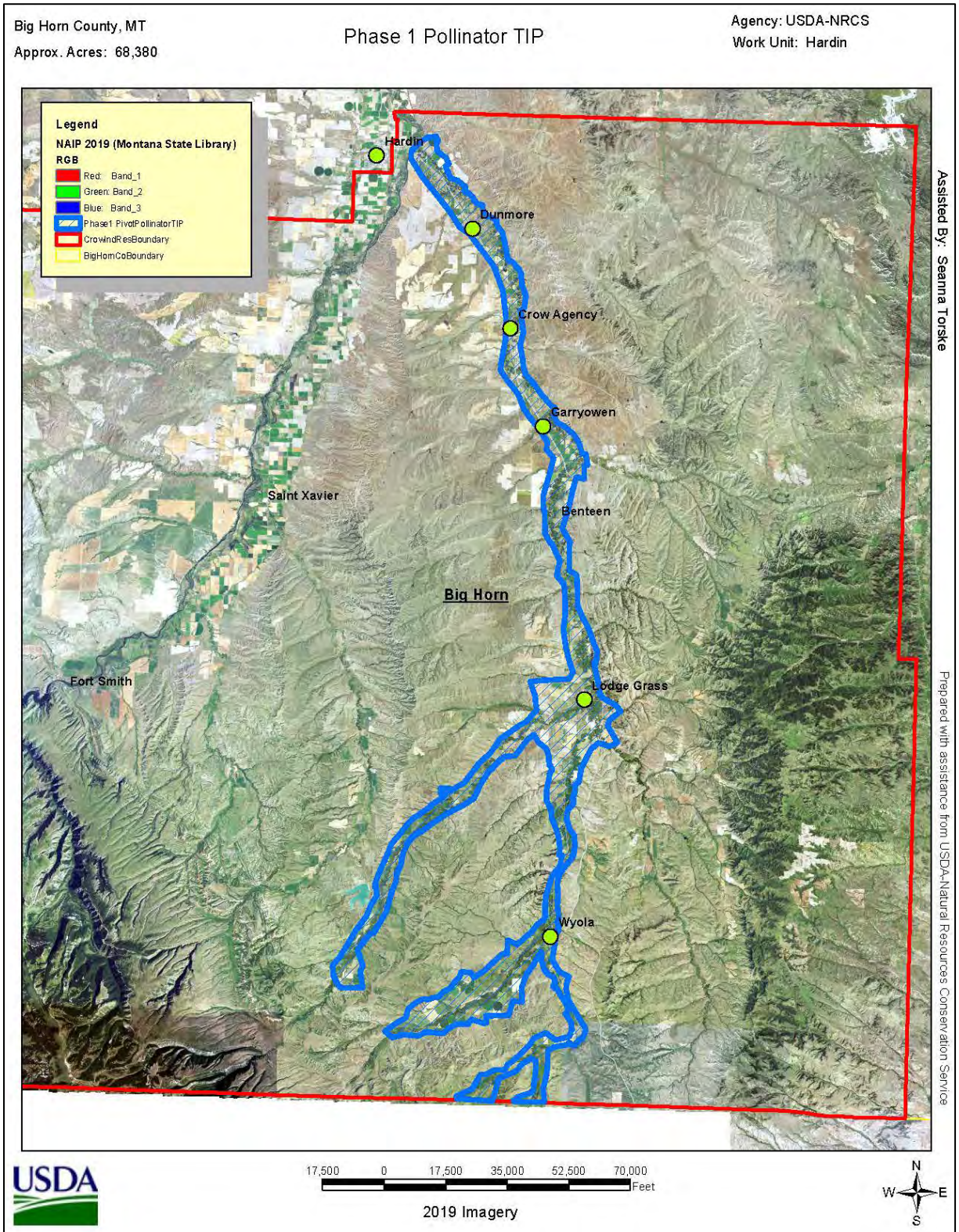


Figure 2.0- TIP project area map.

The 68,380 acre project area encompasses a range of land ownership including private, state, federal, and tribal. According to Landuse Land Cover data (Montana State Library), approximately 40% of the project area is either irrigated or dry cropland (about 27,600 acres). Mixed Riparian (20.99%, 14,346 acres) and Upland Grasslands (10.17%, 6955 acres) make up another large portion of the project area.

Table 2.1- Landuse Land Cover Table

Land Use	Acres	Percent of Total
Agricultural (Cropland)	27613.59	40.39%
Badlands	146.37	0.21%
Barren Land	32.32	0.05%
Conifer Forest	2263.06	3.31%
Dry Shrub/Grassland	390.11	0.57%
Dry Shrubland	2023.85	2.96%
Mines Quarries Gravel Pits	16.24	0.02%
Mixed Conifer Forest	118.35	0.17%
Mixed Deciduous	2971.42	4.35%
Mixed Deciduous-Conifer Forest	231.41	0.34%
Mixed Riparian	14346.	20.99%
Moist Shrub/Grassland	2384.39	3.49%
Moist Shrubland	3981.39	5.82%
Tree/Shrubland	2317.25	3.39%
Upland Grasslands	6955.78	10.17%
Urban	310.92	0.45%
Water	2261.59	3.31%
Total	68365.73	100.00%

The location of the project area houses a number of apiaries (see Figure 5.2 for a map of the apiaries within the project area). The increased pollinator habitat will significantly benefit apiaries within the project area by creating and enhancing additional habitat elements for pollinator species.

Problem Statement:

Pollinators are responsible for assisting over 80% of the world's flowering plants to reproduce (*USDA-Forest Service*). Crops grown in Big Horn County that have flowing plants include: alfalfa, sunflower, safflower, canola, and corn. While some of these crops are majority self-pollinating plants, they also benefit from additional yields through pollinators.

Honey production throughout the state of Montana has decreased in recent years as well, which is concerning. Montana honey production in 2020 from producers with five or more colonies totaled 8.91 million pounds, down 40 percent from 2019, according to the National Agricultural Statistics Service, USDA. There were 110,000 colonies producing honey in 2020, down 36 percent from 2019.

According to the NRCS West National Technology Support Center's Plant Materials technology note 1 (March 2016), *"In 1948, center pivot irrigation was invented as a means to improve water distribution in crop fields. This was a great improvement in water distribution compared to flood irrigation, however, center pivots have created a new dilemma: the pivot corner. Pivot corners are troublesome. Square parcels with a circular system leave unused corners that can amount to 15 to 20% of the available area*

in a square parcel. The result is a large portion of unused ground that could be used to help bring in pollinators, insects, wind breaks or other beneficial practices...Unused pivot corners are an ideal location for pollinator plantings.”

Irrigation improvement projects have consistently been a popular and beneficial request in Big Horn County. According to the Montana NRCS Pollinators Fact Sheet (March 2017) it states, “*By using drop or spray irrigation instead of flooding, producer can avoid drowning ground-nesting pollinators and larvae.*” Unfortunately, past targeted funding for irrigation improvement projects have not included much of the Little Big Horn River valley and its tributaries. Conversions to center pivot irrigation result in a significant labor savings and allow farmers to practice reduced tillage as well as diversifying their cropping rotations. Converting flood-irrigated cropland to sprinkler irrigation has proven to be beneficial for ground-dwelling pollinator species. Often, when flood-irrigated fields are converted to center pivot irrigation, there can be large field corners (5-6 acres each), that are either unproductive or not planted to a crop. These field corners can be subject to wind and water erosion, invasive weed species, and decreasing soil organic matter. Planting these corners to perennial vegetation with forbs that flower throughout the early, mid, and late flowering seasons can provide habitat for a wide variety of pollinator species. All pollinator species will be planted following their appropriate practice standards and specifications, and also according to the Montana NRCS Biology Technical Note MT-20 (Sept. 2021), to ensure all bloom periods will be met with the planned plant species.

The North American Pollinator Protection Campaign (NAPPC) has a Pollinator Friendly Practices (PFP) Guidelines document, which lists six different areas of land use considerations for protection pollinator habitat:

- Foraging Habitat*
- Reproduction
- Shelter
- Invasive/Exotic Species*
- Chemical Use*
- Monitoring*

This TIP proposal will address four of six management items (asterisked), with the reproduction and shelter items considered to be located adjacent to the crop fields. Studies have shown that management of crop fields can be equally as important as simply providing flowering habitat for pollinator species (Gillespie, Long, Williams, 2015), and so the following management practices will be, at a minimum, planned: (595) Pest Management Conservation System, (449) Irrigation Water Management. Residue and Tillage Management, both Reduced Tillage and No-Tillage (345 and 329 practice codes, respectively) will be listed as eligible practices to contract.

This TIP proposal ties directly to the Big Horn County Long Range Plan, and benefits the following items:

- Page 16, Resource Inventory – Soil Erosion: *Both wind and water-induced erosion have been a resource concern on irrigated cropland. This issue has been caused partly from intensive tillage practices used on irrigated cropland, flood irrigation, as well as a lack of irrigation water management.*

- Page 17, Resource Inventory – Soil Quality: *Soil Condition Indexes (SCI) in a typical small grain, small grain, sugar beet rotation has been less than zero... some of these concerns have been solved or mitigated through cropping rotations, adding perennial crops, or addition of soil amendments.*
- Page 19, Resource Inventory – Animals: *Irrigated cropland typically lacks wildlife habitat [including pollinator habitat], especially on fields that are under conventional tillage operations, which leaves very little residue cover on the soil surface.*

This TIP proposal directly ties to the FY2022 Big Horn County and Crow Tribal Local Work Group results. A questionnaire was mailed out by the Big Horn Conservation District (BHCD), and several questionnaire responses cited the Little Big Horn River and its tributaries as having the resource concern of Inadequate Fish & Wildlife Habitat, as well as having issues with Soil Quality Degradation and Water Quantity. The FY2021 Big Horn County Local Work Group meeting also cited soil quality degradation (organic matter depletion) on all landuses as the second priority resource concern.

This TIP proposal directly addresses the USDA Strategic Plan for FY2022-2026 by addressing the following goals and objectives:

- **Goal # 1 Combat Climate Change to Support America’s Working Lands, Natural Resources, and Communities**
 - **Objective 1.1 (Use Climate-Smart Management and Sound Science to Enhance the Health and Productivity of Agricultural Lands)** - By converting flood-irrigated cropland to center-pivot irrigation methods, as well as implementing irrigation water management methods, cropland productivity is managed to greater level than previously and is expected to result in higher yielding crops on these acres. By providing pollinator habitat in the pivot corners, any flowering crops will have greater access to pollinator species (alfalfa, corn, safflower, legumes, etc.) that can increase crop yields. Also, the increase pollinator habitat will significantly benefit apiaries within the project area. Pest management planning will also be implemented on these acres in an effort to encourage farmers to practice best management practices for protecting pollinators and their habitat.
 - This TIP proposal is also located on the Crow Indian Reservation. Crow people as a culture have historically collected fruits from wild flowering shrubs on the reservation, such as chokecherry, wild plum, buffaloberry, etc. Increasing pollinator habitat adjacent to riparian areas will benefit production on these berry-producing trees and shrubs, which would result in more wild fruit for the Crow people and their families.
 - **Objective 1.4 (Increase Carbon Sequestration, Reduce Greenhouse Gas Emissions, and Create Economic Opportunities)** – Encouraging conservation tillage, and converting pivot corners to perennial vegetation will increase carbon sequestration on the enrolled acres. Participants will sign an agreement with the Big Horn CD agreeing to maintain the pollinator habitat at least for the structural lifespan of the installed irrigation practices (15 years). Phase 1 of this project is located on the Crow Indian Reservation in Big Horn County, and these planned projects will provide economic opportunities for local farmers and will increase property values in a historically underserved area.
- **Goal # 3 Foster an Equitable and Competitive Marketplace for All Agricultural Producers**

- Objective 3.1 (Foster Sustainable Economic Growth by Promoting Innovation, Building Resilience to Climate Change, and Expanding Renewable Energy – Increasing pollinator habitat, lowering tillage operations, and managing irrigation water are all methods that can help build resistance to climate change on irrigated cropland within the project area.
- **Goal # 5 Expand Opportunities for Economic Development and Improve Quality of Life in Rural and Tribal Communities**
 - Objective 5.3 (Increase Capacity, Sustainability, and Economic Vitality in Rural and Tribal Communities) – One hundred percent of the phase 1 project area for this TIP is located on the Crow Indian Reservation in Big Horn County. Improving on-farm irrigation delivery systems will provide economic opportunities for local farmers and will increase property values in a historically underserved area.

Goals and Objectives:

What this TIP will accomplish includes the following:

- Creating an additional 1000 (approximately 758 football fields) acres of pollinator habitat through the suite of practices listed in alternative 2 below. Establishing pollinator habitat will directly address the priority resource concern and two additional resource concerns for this TIP. Partners will ensure the habitat is maintained beyond the period of performance of the program contract (see the partners section of this proposal for additional information).
- Converting flood-irrigated crop to center pivot irrigation through the practices listed in Alternative 2 on approximately 3000 acres (or approximately 2272 football fields), will enable pollinator habitat establishment on the corners of the crop fields, and will help preserve habitat for ground-dwelling pollinators under the sprinkler-irrigated fields. Ranking points will be given for projects that adjacent to undisturbed riparian habitat that are also excellent sources of ground-dwelling pollinator habitat.
- Requiring (645) Upland Wildlife Habitat Management to be contracted on all acres will ensure the priority resource concern (Terrestrial Habitat) is being addressed and will teach the program participants how to monitor their own ag lands for honeybee populations.
- Requiring (595) Pest Management Conservation System to be, at a minimum, planned on all acres (4000 acres), will ensure the priority resource concern (Terrestrial Habitat), and Degraded Plant Condition secondary resource concern are protected for life of the program contract.
- Requiring (449) Irrigation Water Management to be, at a minimum planned on all irrigated acres (3000 acres), will ensure that best management practices for irrigation and pollinators are communicated to program participants, which will address the priority resource concern (Terrestrial Habitat) for this TIP proposal.

Alternatives:

- No Action Alternative– Irrigated cropland would continue to be managed at the existing level (no irrigation water management, no pest management with specific pollinator habitat considerations, etc.) with existing on-farm irrigation infrastructure. If ag operators choose to install an irrigation pivot at their own cost, there is a significant potential for the pivot corners to remain idle, resulting in risks of soil erosion or decreasing soil organic matter.
- Pollinator Habitat Improvement – Management Only Alternative 1 (not chosen) – Eligible landuses would include: Irrigated Crop.

- Eligible Practices:
 - (512) Pasture & Hay Planting
 - (550) Range Planting
 - (386) Field Border
 - (327) Conservation Cover
 - (345) Residue and Tillage Management, Reduced Tillage
 - (329) Residue and Tillage Management, No-Till
 - (328) Conservation Crop Rotation
 - (449) Irrigation Water Management (this will be required to be planned)
 - (595) Pest Management Conservation System (this will be required to be planned)
 - (645) Upland Wildlife Habitat Management (this will be required to be planned)
- This alternative wasn't chosen; while it was creating new pollinator habitat, as well as preserving habitat through residue and tillage management practices, as well as other management practices, it wasn't as holistic of an alternative as number two. The additional practices in alternative 2 would be a sufficient incentive to get ag producers to provide pollinator habitat on their cropland, and to manage it at a higher level.
- Pollinator Habitat Improvement – Management and Infrastructure Alternative (Chosen) –Eligible landuses would include: Irrigated Crop (main landuse), but to also include AAL, Farmstead, since a lot of 587, 533, and 430 practices cross these landuses, and some of these areas have the opportunity to provide additional enhanced pollinator habitat. Applicants who only wish to plant pollinator habitat are eligible to apply. To meet the intent of the TIP, all applicants who want to install irrigation improvement projects will be required to plant pollinator habitat.
 - Eligible Practices (asterisked practices are listed on Montana's Climate-Smart Activities FY2023 list):
 - (587) Structure for Water Control
 - (533) Pumping Plant
 - (430) Irrigation Pipeline
 - (442) Sprinkler System
 - Due to the intent of this TIP to establish pollinator habitat in the corners of the field, only center pivot practices components will be allowed, and swing arms would **not** be allowed in this alternative.
 - Primary CSAF Practices to establish pollinator habit – Each of these practices will require at least one blooming species per bloom period – early, mid and late. Seedings may contain a maximum 50% grasses and maximum 5% non-native legumes. To meet the intent of this TIP, at least one of four planting practices below will need to be contracted and will be listed as the primary practice for the application. See below for additional scenario information on specific practices.
 - *(512) Pasture & Hay Planting
 - Scenario #2: Establishment of a mixture of adapted perennial species on a cropland, pasture or rangeland unit to improve wildlife habitat, benefit pollinators & beneficial insects, improve forage condition, and/or reduce erosion. This mix should contain at a minimum two or more species of native perennial species. This scenario has forgone income.
 - Scenario #3: Establishment of a mixture of adapted perennial species on cropland, pasture or rangeland unit to improve wildlife

- habitat, benefit pollinators & beneficial insects, improve forage condition, and/or reduce erosion. This mix should contain at a minimum two or more species of native perennial species. No forgone income.
- *(550) Range Planting
 - Scenario #3: Establishment of a mixture of NATIVE perennial species on a cropland, pasture, hay land or rangeland unit to improve wildlife habitat, benefit pollinators & beneficial insects, improve forage condition, and/or reduce erosion. Seed mix must include 3 native forbs and 3 species of cool season native perennial grasses.
 - *(327) Conservation Cover
 - Scenario #30: Permanent vegetation, including a mix of native grasses, legumes, and forbs (mix may also include non-native species), established on land needing permanent vegetative cover that provides habitat for pollinators. The native grass and forb/legume mix include specialized species. In addition to providing pollinator habitat, this practice scenario may also reduce sheet and rill erosion, improve soil quality, improve water quality, and improve air quality. The practice may also provide wildlife habitat. Practice applicable on cropland, odd areas, corners, etc. Applies to conventional or organic systems. This scenario includes forgone income.
 - Scenario #93: Permanent vegetation, including a mix of grasses, legumes, and forbs established on any land needing permanent vegetative cover that provides habitat, cover, and food for pollinators.
 - *386 Field Border
 - Scenario #7: A strip of permanent vegetation established at the edge or around the perimeter of a field. This practice may also apply to recreation land or other land uses where agronomic crops including forages are grown. Practice includes seedbed prep and planting of pollinator friendly species.
 - Scenario #44: A strip of permanent vegetation established at the edge or around the perimeter of an agricultural field. Practice includes seedbed prep and planting of pollinator friendly herbaceous species. The area of the field border is taken out of production and includes foregone income.
 - Scenario #46: A strip of permanent vegetation established at the edge or around the perimeter of an agricultural field. Practice includes seedbed prep and planting of pollinator friendly herbaceous species. The area of the field border is taken out of production and does not include foregone income.
 - Either of the following residue and tillage management practices will at a minimum be planned:
 - *(345) Residue and Tillage Management, Reduced Tillage
 - *(329) Residue and Tillage Management, No-Till
 - *(328) Conservation Crop Rotation
 - (449) Irrigation Water Management (this will be required to be planned)

- (595) Pest Management Conservation System (this will be required to be planned)
- *(645) Upland Wildlife Habitat Management (this will be required to be contracted on all acres in the contract)

Alternative 2 is believed to be the most effective alternative that will accomplish the project goal of additional pollinator habitat. This alternative is mutually beneficially to the agency and its customers by establishing pollinator habitat, providing best management practices for pollinators, and also improving on-farm irrigation water application methods, which are highly beneficial for ground-dwelling pollinators. Conversion from flood to sprinkler or drip-tape irrigation better enables the producer to implement the Soil Health practices (reduced tillage, diversifying their crop rotation, managing irrigation water, etc.) that are also beneficial for improving and maintaining All projects funded through this alternative should be able to be implemented well within the five-year contract lifespan.

Implementation

Our goal for this project is to create or improve pollinator habitat on 4000 acres. This can be accomplished by completing projects with approximately 17 participating producers in fiscal years 2024-2027, with FY2028 being the final year of the project that can be used for evaluation of the project. If enough participation is experienced in the first and second years of this TIP, the Hardin Field Office plans to apply for a second phase of this project into the Big Horn River Valley south of Hardin down to Fort Smith. If there is sufficient interest from phases one and two, a third phase of this project would then be applied for in the North Valley area from north of Hardin to the north end of the valley along the Big Horn County line (please see the map listing all three phases of this TIP in the Appendix). Phase three is also expected to connect the pollinator TIP corridor to the phase one project area of the Yellowstone County Pollinator TIP (also being submitted for consideration for FY2024).

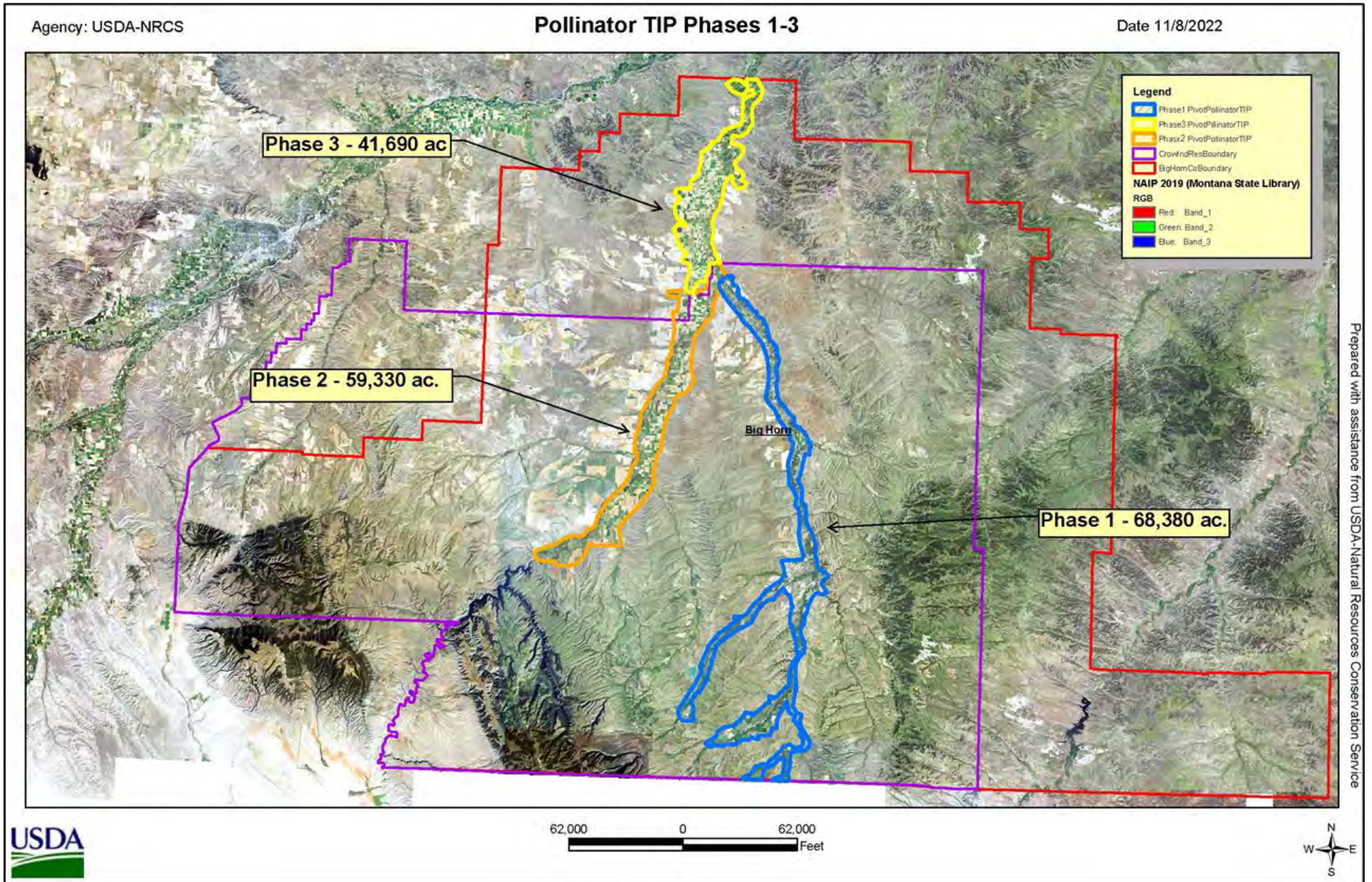


Figure 3.0 - Map of the three proposed TIP phase areas.

Table 3.1- Proposed TIP EQIP Budget and Timeline

Year	Acres	Project Cost	Estimated Number of EQIP Contracts
1	1000	\$ 800,000.00	4
2	2000	\$ 1,400,000.00	7
3	500	\$ 600,000.00	3
4	500	\$ 600,000.00	3
5	0	\$ -	0
Total	4000	\$ 3,400,000.00	17

Table 3.2 – (Using FY2023 EQIP Payment Schedule) Typical project estimate for a contract with one field.

Practice Code	Practice Name	Component	Unit Cost	Unit	Extent	Total Cost
587	Structure for Water Control	Misc. Structure, Medium	\$12,659.22	ea	1	\$12,659
587	Structure for Water Control	Flow Meter with Electronic Index	\$261.31	in	8	\$2,090
533	Pumping Plant	Electric-Powered Pump, 5 to 30 Horsepower	\$417.82	hp	30	\$12,535
430	Irrigation Pipeline	Polyvinyl Chloride (PVC) Pipe, less than or equal to 8 inch	\$2.85	lb	8000	\$22,800
442	Sprinkler System	Center Pivot, >= 1200 feet	\$655.76	ac	120	\$78,691
449	Irrigation Water Management	Intermediate IWM, Year 1	\$1,597.93	fld	1	\$1,598
449	Irrigation Water Management	Intermediate, Years 2 and 3	\$870.78	fld	1	\$871
449	Irrigation Water Management	Intermediate, Years 2 and 3	\$870.78	fld	1	\$871
595	Pest Management Conservation System	Plant Health PAMS (acs) Low Labor Only	\$11.24	ac	160	\$1,798
512	Pasture and Hay Planting	Pollinator Friendly, with Foregone Income	\$317.08	40	40	\$12,683
645	Upland Wildlife Habitat Management	Honeybee Monitoring	\$21.16	ac	40	\$846
Total Payment Rate						\$147,442.99

Table 3.3 – Typical project estimate for a contract with two fields.

Practice Code	Practice Name	Component	Unit Cost	Unit	Extent	Total Cost
587	Structure for Water Control	Misc. Structure, Medium	\$12,659.22	ea	1	\$12,659
587	Structure for Water Control	Flow Meter with Electronic Index	\$261.31	in	8	\$2,090
587	Structure for Water Control	Flow Meter with Electronic Index	\$261.31	in	8	\$2,090
533	Pumping Plant	Electric-Powered Pump, 30 to 74 HP	\$319.56	hp	50	\$15,978
533	Pumping Plant	Soft Start, 30-75 HP	\$63.54	hp	50	\$3,177
430	Irrigation Pipeline	Polyvinyl Chloride (PVC) Pipe, less than or equal to 8 inch	\$2.85	lb	8000	\$22,800
430	Irrigation Pipeline	Polyvinyl Chloride (PVC) Pipe, greater than or equal to 10 inch	\$2.37	lb	6000	\$14,220
442	Sprinkler System	Center Pivot, >= 1200 feet	\$546.46	ac	120	\$65,575
442	Sprinkler System	Center Pivot, >= 1200 feet	\$546.46	ac	80	\$43,717
449	Irrigation Water Management	Intermediate IWM, Year 1	\$1,597.93	fld	2	\$3,196
449	Irrigation Water Management	Intermediate, Years 2 and 3	\$870.78	fld	2	\$1,472
449	Irrigation Water Management	Intermediate, Years 2 and 3	\$870.78	fld	2	\$1,472
595	Pest Management Conservation System	Plant Health PAMS (acs) Low Labor Only	\$11.24	ac	200	\$2,248
550	Range Planting	Native, Wildlife or Pollinator	\$253.77	40	70	\$17,764
645	Upland Wildlife Habitat Management	Honeybee Monitoring	\$21.16	ac	70	\$1,481
Total Payment Rate						\$210,479.26

Figure 3.4 – Typical project estimate for a pollinator planting without any irrigation improvement projects.

Practice Code	Practice Name	Component	Unit Cost	Unit	Extent	Total Cost
386	Field Border	Field Border, Pollinator	\$378.45	ac	8	\$3,028
512	Pasture and Hay Planting	Pollinator Friendly, No Foregone Income	\$136.63	40	15	\$2,049
645	Upland Wildlife Habitat Management	Honeybee Monitoring	\$21.16	ac	23	\$478
Total Payment Rate						\$5,563.73

Partners:

- Big Horn Conservation District (BHCD)– The BHCD can provide outreach to the public about TIP results and program signups via their newsletter. BHCD has also agreed to work with program participants to sign an operator agreement with them that certifies the participant will maintain the pollinator habitat for at least the NRCS-established program lifespan for the irrigation practices (minimum 15 years). By signing an agreement such as this, NRCS and our partners can ensure the pollinator habitat will be maintained beyond the life the EQIP contract. BHCD has been regularly apprised of the progress of this TIP proposal throughout the entire planning process.
 - BHCD contributions to this TIP are estimated at about 40 hours for the life of this TIP, totaling approximately \$800.00 in partner-contributed wages (40 hrs x \$20/hr).
- Pheasants Forever (PF) – NRCS currently has PF-partner employees stationed at the Billings and Hysham NRCS Field Offices. These partner employees can assist the BHCD in their operator agreement by performing annual site visits to ensure the pollinator habitat is being maintained.

- PF partner employee contributions to this TIP are estimated at about 80 hours annually, totaling 400 hours throughout the life of the Phase 1 TIP (80 hrs x 5 yrs), and approximately \$8000.00 in partner-contributed wages (400 x \$20/hr).
- MSU Extension – The Big Horn County MSU Extension has access to subject matter experts at Montana State University who can provide educational information to participants when the NRCS Field Office organizes outreach workshops for this TIP.
 - Each workshop would constitute at least 16 hours per subject matter expert (SME), which includes topic presentation preparation, travel, and actual presentation of the topic. With at least one outreach workshop planned for this TIP, MSU Extension's approximate contribution to this TIP would be 16 hours, totaling \$640.00 (16 hrs x \$40/hr).
- Big Horn County Weed District (BHCWD) – The BHCWD has spray equipment that can be rented out to people who live in Big Horn County, which can be helpful for people to implement Herbaceous Weed Treatment on their acres. The BHCWD board oversees the duties of the BHCWD and have also been regularly apprised of the progress of this TIP proposal throughout the planning process.
- Xerces Society – Xerces is the national leader for invertebrate conservation and consistently partners with the NRCS to conserve invertebrates across the states. They have written a letter supporting this proposal and are a source for significant information. All monitoring protocol is based on the Xerces/NRCS pollinator monitoring protocol. There could be opportunity for public information and presentations from SME's with the Xerces Society throughout the TIP. While working with Xerces Society on this TIP proposal, they had also requested to share this proposal with the Wyoming NRCS, as they have done work with them on pollinator habitat previously.
 - Each workshop would constitute at least 16 hours per subject matter expert (SME), which includes topic presentation preparation, travel, and actual presentation of the topic. With at least one outreach workshop planned for this TIP, Xerces' approximate contribution to this TIP would be 16 hours, totaling \$640.00 (16 hrs x \$40/hr).

Outcomes:

This TIP proposal shows potential for improvements to both wildlife and pollinator habitat, as evidenced by several NRCS planning tools:

- The Pollinator Habitat Evaluation Guide (MT NRCS Biology Technical Note #19, Sept. 2021), or PHEG, is a tool that provides the NRCS planner with a relatively simple and objective procedure for determining the value of pollinator habitat for an area where a landowner is interested in the creation or enhancement of habitat. The guide can be used on land where pollinators are a primary or secondary resource concern. The PHEG tool shows the no action alternative having a nearly zero score for pollinator habitat value (PHEG score between 0 – 1.0). Both of the action alternatives show an average 0.58 habitat value score, which is a significant improvement to pollinator habitat within the TIP project area. To put this score into perspective, going from a nearly zero to a 0.58 score means the cropland landuse that had almost no valuable pollinator habitat now has viable pollinator habitat, through an increase in pollinator plant canopy, and increased plant species diversity. Creating additional pollinator habitat will have positive effect

on pollinator-reliant plants and will result in increased yields to these crops with zero increase to the carbon footprint.

- According to a 2014 study that compared the contribution of pollinators to crop yield and quality (Bartomeus, 2014), insect pollination enhanced average crop yields between 18 and 71%, depending on the crop. If crop fields adjacent to pollinator habitat saw a minimum 18% increase in yield to a field pea crop, this could result in significant income increases per field. For example:
 - Average yield per acre of Austrian Winter Pea could be 1000 lb/ac. If there was an 18% yield increase, you would see an additional 180 lb/ac. NASS data from 2021 shows roughly a \$10/CWT price, so there could potentially be a \$18/ac increase. With an average field size of 80 acres, this project could produce an additional 14,000 pounds of food produced with an overall reduced energy input.
 - This TIP proposal is also located on the Crow Indian Reservation. Crow people as a culture have historically collected fruits from wild flowering shrubs on the reservation, such as chokecherry, wild plum, buffaloberry, etc. Increasing pollinator habitat adjacent to riparian areas will benefit production on these berry-producing trees and shrubs, which would result in more wild fruit for the Crow people and their families. Ranking points will be given to projects located adjacent or nearby to riparian areas that could host these flowering shrubs.
- The Wildlife Habitat Evaluation Guide (MT NRCS Biology Technical Note #19, Sept. 2021), or WHEG, is a tool co-located with the PHEG in the biology tech note MT-20 that gives planners an objective procedure for determining the value of wildlife habitat on any Conservation Treatment Unit (CTU). In order to meet the NRCS' Field Office Technical Guide (FOTG) Quality Criteria for a Resource Management System, the planned system must provide a Habitat Value of 50% or higher (0.5 out of 1.0) for the (CTU). While individual projects will vary in terms of various wildlife attributes, the average WHEG score for the Cropland landuse in this TIP proposal is 0.41 for the No Action Alternative (using current program applications to develop average site WHEG ratings); 0.62 for Alternative 1; and 0.66 for Alternative 2 (chosen). What the WHEG tool tells us is that creating pollinator habitat will also create habitat that benefits wildlife as well, such as the decrease in tilled acres that provide additional ground nesting area for pollinators, increased perennial herbaceous cover, etc.

As people sign up for program funding, NRCS will collect baseline data for the following operations, including the following:

- Pollinator monitoring- Following the Xerces monitoring protocol, we expect to see a significant increase in pollinator use of plantings associated with this TIP. Monitoring will be completed twice during the year of signup and twice following establishment of the pollinator plantings.
 - Bee Monitoring Data for Large Habitat will be utilized, where field staff conduct a minimum of two 100 foot transects in open areas of plantings.
 - Pheasants forever staff will also perform pollinator monitoring every year following establishment of the pollinator planting.

- Irrigation Water Management- Existing methods of irrigation water management will be documented, and when conversion from floor to center pivot irrigation is planned, an updated irrigation water management plan will be created with the participant.
- Current and Planned Cropping Rotations.
- Current and Planned Residue Management.

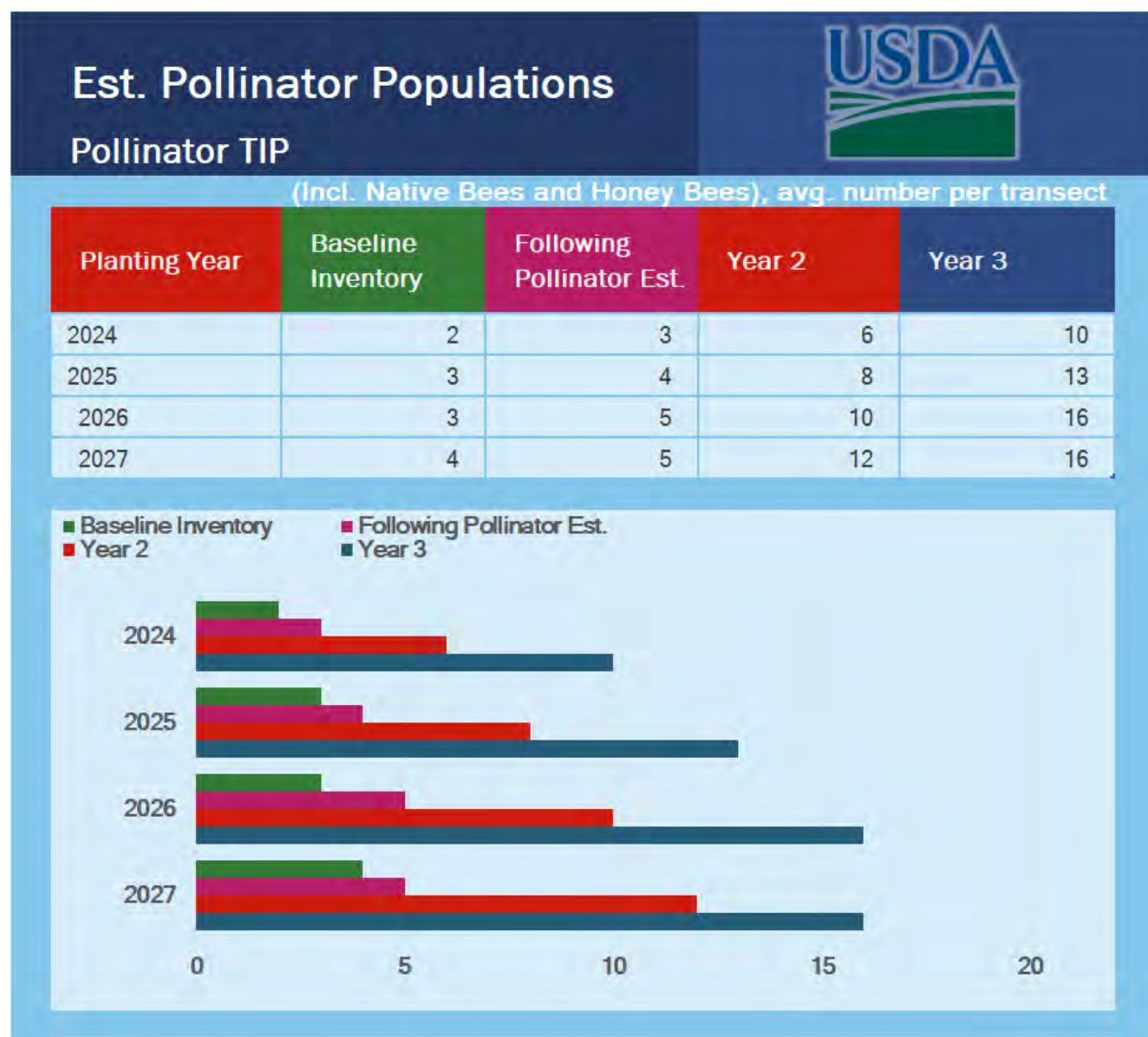


Figure 4.1 – Table showing the estimated increases in pollinator populations (averaged per site).

A common barrier to adopting soil health and climate practices such as Conservation Crop Rotation and Residue & Tillage Management on flood-irrigated crop fields is ensuring uniform application of irrigation water. By converting irrigated crop from flood to center-pivot irrigation, operators will be able to apply their irrigation water uniformly while adopting these practices, which also benefit pollinators and their habitat requirements.

Ranking Questions:

1. If flood to center-pivot irrigation is planned, how much of the pivot centers will be planted to pollinator habitat?
 - a. 100% (If irrigation practices are not planned, select this answer.)
 - b. 75% to 99%
 - c. 50% to 74%
 - d. 49% to 30% (Any less than 30% will result in the project not meeting the intent of the TIP and will not be considered for funding in this TIP fund pool.)
2. Does the seed mix have at least four forb species from the MT-20 Biology Tech Note “Creating and Enhancing Habitat for Pollinator Insects”?
3. Does the seed mix have at least four forb species that bloom in the early, mid, and late seasons?
4. Is the project within a mile of an apiary?
5. Will any of the following practices be contracted: (595) Pest Management System; (345) Residue and Tillage Management, Reduced Till; (329) Residue & Tillage Management, No-Till; ?
6. Are there no irrigation practices in this application (application only seeks to create pollinator habitat)?
7. How far is this project located from riparian habitat?
 - a. Directly adjacent
 - b. Less than ¼ mile
 - c. ¼ mile or greater

Workload:

The local NRCS Field Office staff are expected to be able to handle at least 95% of the inventory, survey, design, and planning work of initial program applications.

Eventually, we hope this TIP will result in a “phase two” TIP for this project area that would address other areas with the same resource concerns, and to also connect the pollinator TIP areas in Yellowstone County (refer to the “Additional Maps” section to see the phase two and three maps in the appendix).

References

- Range Analysis Platform, <https://rangelands.app/rap/>
- Montana State Library, ArcGIS Imagery.
- USDA-NRCS Big Horn County Long Range Plan
- USDA Strategic Plan Fiscal Years 2022-2026
- USDA-Forest Service, [Pollinators \(usda.gov\)](https://www.usda.gov/pollinators)
- North American Pollinator Protection Campaign (NAPPC) Pollinator-Friendly Practices (PFP) [PollinatorFriendlyPractices_170624_114657.pdf](https://www.napcc.org/pfp/PollinatorFriendlyPractices_170624_114657.pdf)
- Indirect Effects of Field Management on Pollination Service and Seed Set in Hybrid Onion Seed Production, Sandra Gillespie, Rachael Long, Neal Williams, Journal of Economic Entomology, Volume 108, Issue 6, December 2015, Pages 2511–2517, <https://doi.org/10.1093/jee/tov225>.
- MT-NRCS Biology Technical Note 20 (revision 10), Creating and Enhancing Habitat for Pollinator Insects, Sept. 2021.
- MT-NRCS Biology Technical Note 19 (Revision 5), Wildlife Habitat Evaluation Guides For Montana, Sept. 2021.
- NRCS West National Technology Support Center Plant Materials Technical Note 1, What to Do with Irrigation Pivot Corners, March 2016.
- USDA-NRCS Montana Program Payment Schedules, [Montana Payment Schedules | NRCS \(usda.gov\)](https://www.nrcs.usda.gov/pmt/payment-schedules).
- Contribution of insect pollinators to crop yield and quality varies with agricultural intensification, Bartomeus, March 2014, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3976118/>.
- USDA-National Ag Statistics Service (NASS) Quick Data
- USDA-NASS 2021 Agricultural Statistics Report
- USDA-NRCS Montana Pollinators Fact Sheet, March 2017.
- [Ag stats: 2020 honey production report for the USDA mountain states region | Kiowa County Press - Eads, Colorado, Newspaper](https://www.usda.gov/media/104441)
- Streamlined Bee Monitoring Protocol for Assessing Pollinator Habitat, Xerces, [14-021_01_XercesSoc_Streamlined-Bee-Monitoring-Protocol_web.pdf](https://www.xerces.org/pubs/14-021_01_XercesSoc_Streamlined-Bee-Monitoring-Protocol_web.pdf)

Additional Information:



Big Horn Conservation District Operator Agreement

I, _____ (Printed Name), will agree to maintain the perennial pollinator habitat for at least fifteen years (minimum estimated practice lifespan of the irrigation projects listed in the Pivot for Pollinators Targeted Implementation Plan proposal) according to the NRCS practice standards and specifications for the planned pollinator practice.

By signing this agreement, I am also allowing any partner employees access to the pollinator habitat to perform annual status reviews to ensure establishment, and to make any recommendations to address stand issues that may be present.

Signed:

OPERATOR SIGNATURE

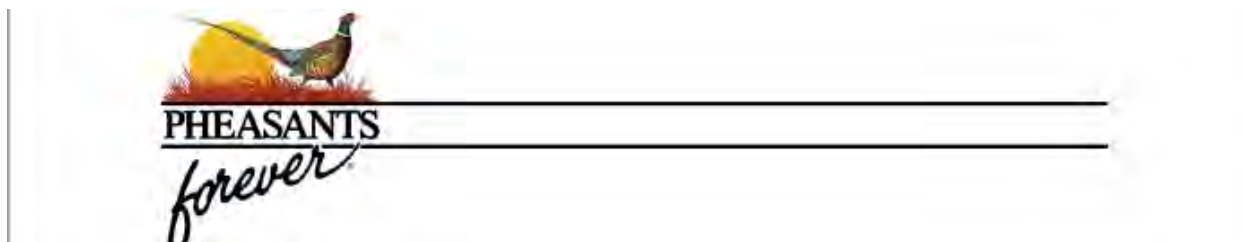
DATE

Acknowledged by:

HCD REPRESENTATIVE

DATE

Figure 4.0 – BHCD Operator Agreement that will be signed by the program participant and BHCD representative.



TO: Natural Resources Conservation Service

RE: Support for the Big Horn County Targeted Implementation Plan (TIP) FY 24 Proposal "Pivot for Pollinators"

Dear NRCS:

On behalf of Pheasants Forever, I am writing in full support of the Big Horn County Targeted Implementation Plan (TIP) FY 24 Proposal "Pivot for Pollinators." Pheasants Forever and the NRCS have a strong partnership and have successfully completed multiple partnership projects. This TIP is a continuation of this strong partnership and helps move the needle for conservation of imperiled pollinator populations. Additionally, this TIP provides win-win opportunities for agricultural operations which is the foundation of successful private land conservation activities.

The conservation activities supported by this TIP will complement a variety of ongoing conservation initiatives that PF and other partners are currently implementing in the state of Montana. Our local partner biologist staff hosted by Pheasants Forever in partnership with NRCS in Billings and Hysham will be a critical component of the successful implementation of this TIP and can effectively leverage other partnerships to ensure this TIP's success. Additionally, Pheasants Forever is committed to assisting with the producer outreach, cost-sharing quality pollinator seed, and monitoring of pollinator plots.

Pheasants Forever is dedicated to the conservation of pheasants, quail, and other wildlife through habitat improvements, public access, education, and conservation advocacy. Pheasants Forever strongly supports the efforts of the Big Horn County NRCS and their vision of this Targeted Implementation Plan. We look forward to this continued partnership successful execution of this proposed project.

Sincerely,

A handwritten signature in black ink, appearing to read "Hunter VanDonsel", is positioned below the "Sincerely," text.

Hunter VanDonsel
Montana/Wyoming State Coordinator
Pheasants Forever inc.

Figure 4.1 – Pheasants Forever Letter of Support



Protecting the Life that Sustains Us

October 10th, 2022

Dear NRCS:

I write on behalf of the Xerces Society for Invertebrate Conservation in support of the Hardin NRCS Field Office's FY2024 Pivot for Pollinators Targeted Implementation Plan (TIP) FY 24 Proposal. Pollinators and the pollination services they provide are essential to agricultural systems and human health and diet. Additionally, pollinators are key to the health of flowering plants and the wildlife that depends upon those plants. This TIP will advance the conservation of pollinator populations in Montana while simultaneously giving agricultural producers the opportunity to improve their operations and irrigation methods.

The Xerces Society for Invertebrate Conservation is an international nonprofit organization that protects the natural world through the conservation of invertebrates and their habitats. Thus, creating, enhancing, and protecting pollinator habitat is one of Xerces' primary goals. The Xerces Society therefore fully supports the goals and commitments presented within the Hardin NRCS Field Office's FY2024 Pivot for Pollinators Targeted Implementation Plan (TIP) FY 24 Proposal. Please consider this valuable project.

Thank you for your time.

Sincerely,

A handwritten signature in black ink, appearing to read 'Mace Vaughan', with a long horizontal line extending to the right.

Mace Vaughan
CO-Director, Pollinator and Agricultural Biodiversity Conservation Program
Xerces Society for Invertebrate Conservation
mace.vaughan@Xerces.org

A handwritten signature in blue ink, appearing to read 'Sarah Hamilton Buxton', with a long horizontal line extending to the right.

Sarah Hamilton Buxton
Farm Bill Pollinator Conservation Partner
Xerces Society for Invertebrate Conservation
Sarah.hamilton-buxton@xerces.org
(701) 530-2014

628 NE Broadway, Suite 200 Portland, OR 97232 1.855.232.6639 www.xerces.org

Figure 4.2 – Xerces Society Letter of Support

Additional Maps:

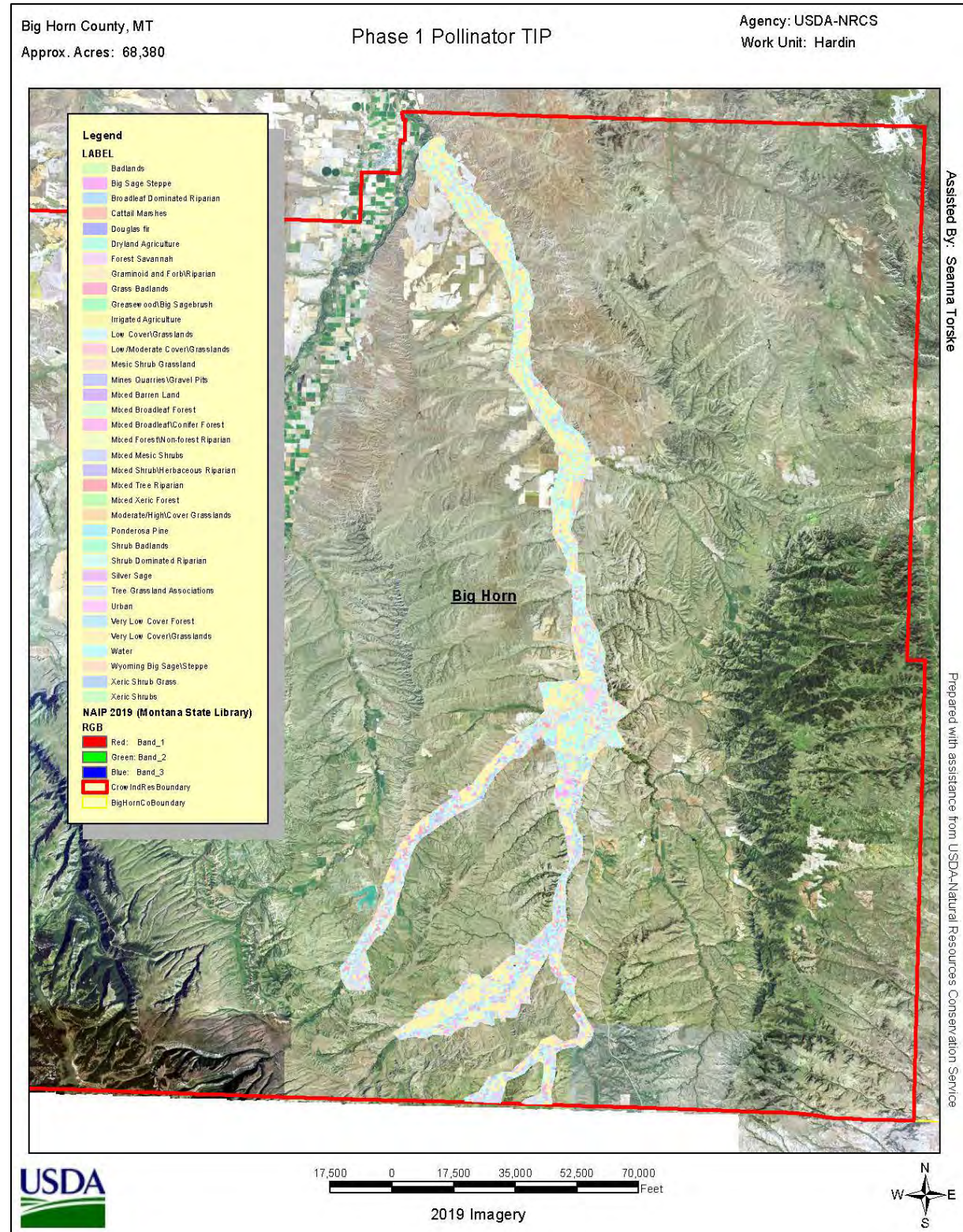


Figure 5.0 – Landuse Land Cover data (Montana State Library ArcGIS) highlights the total landuse landcover acres in the project area. Refer to Figure 2.2 for the table showing the landuse land cover percentages and approximate acres.

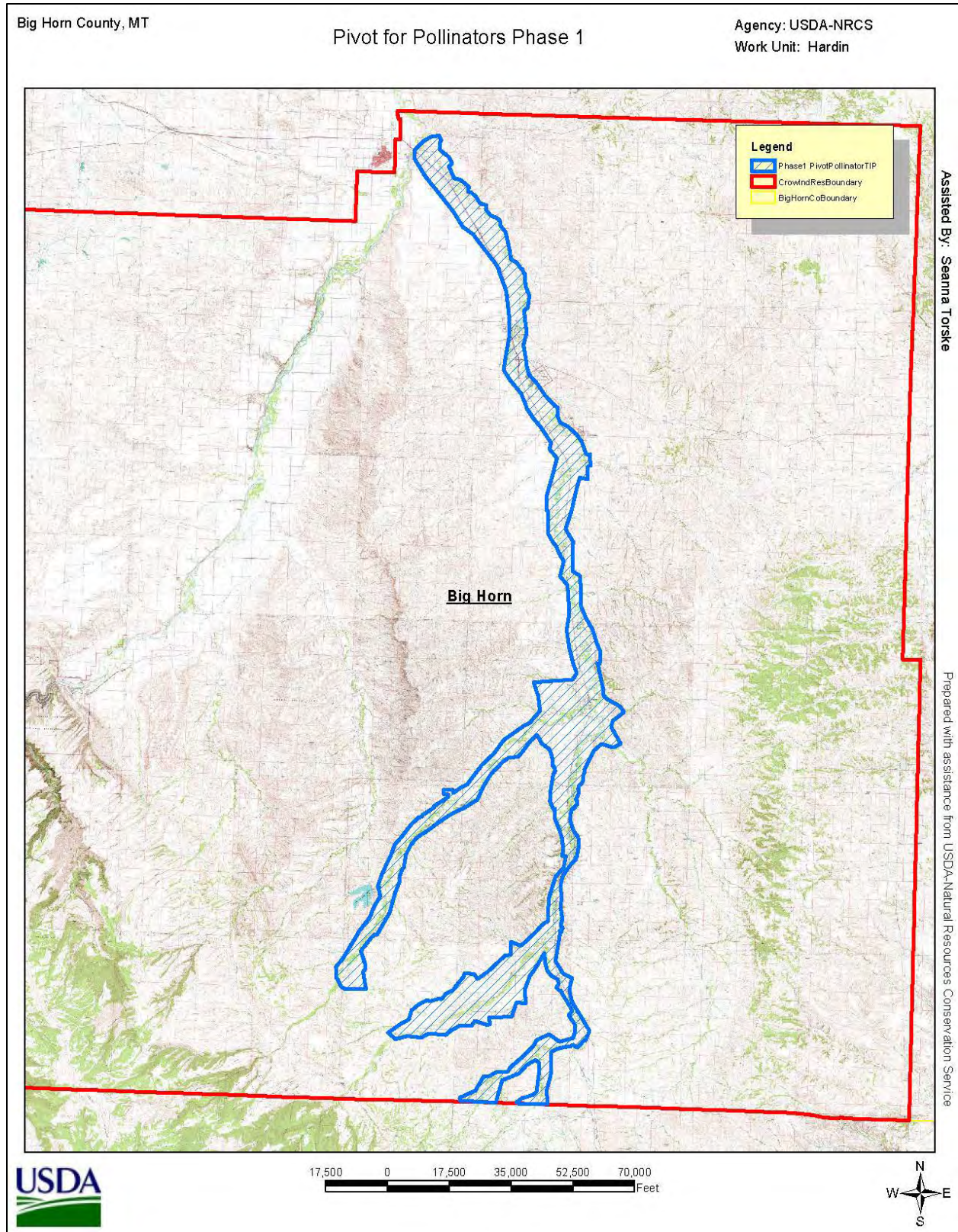


Figure 5.1 – Topography Map of TIP project area.

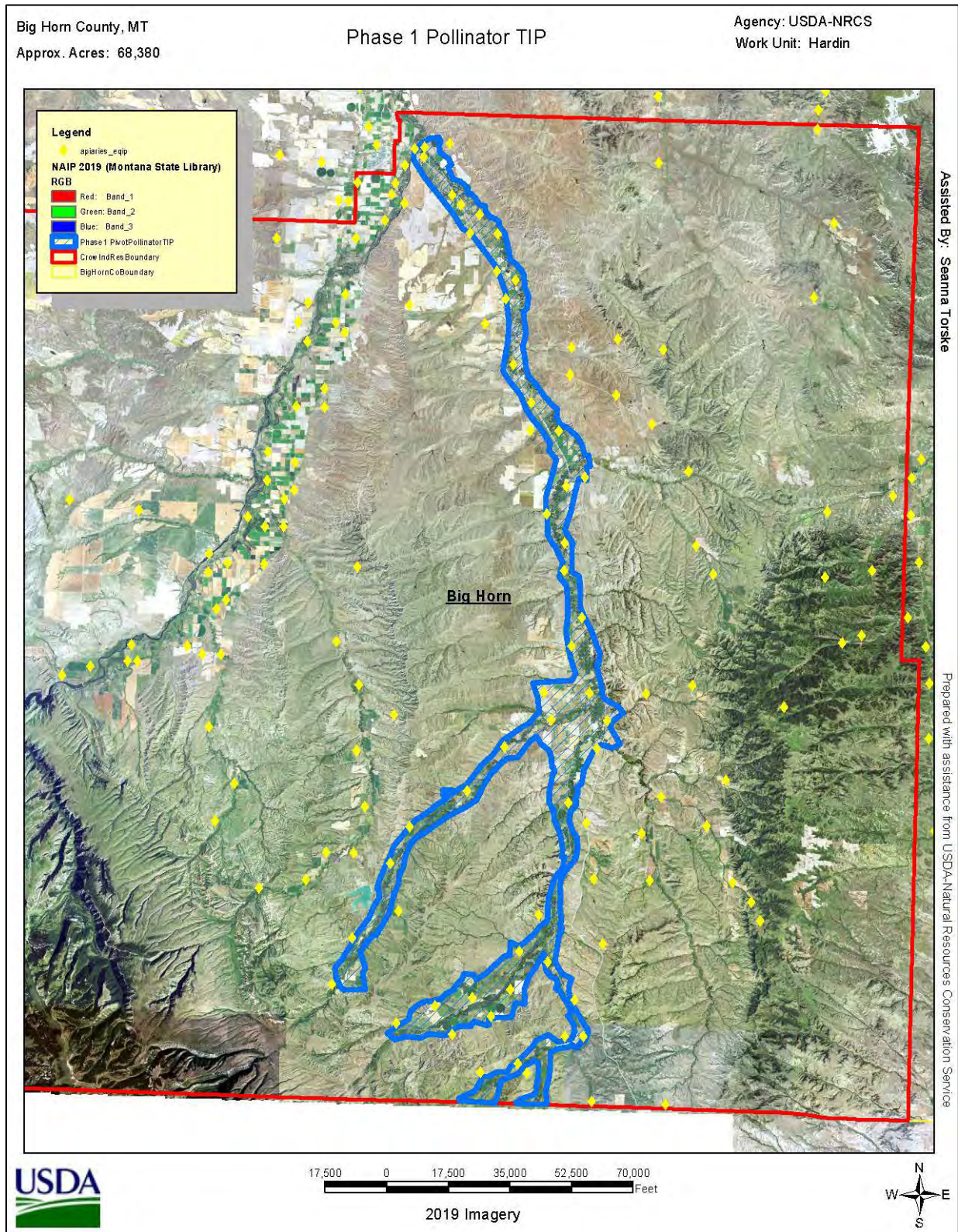
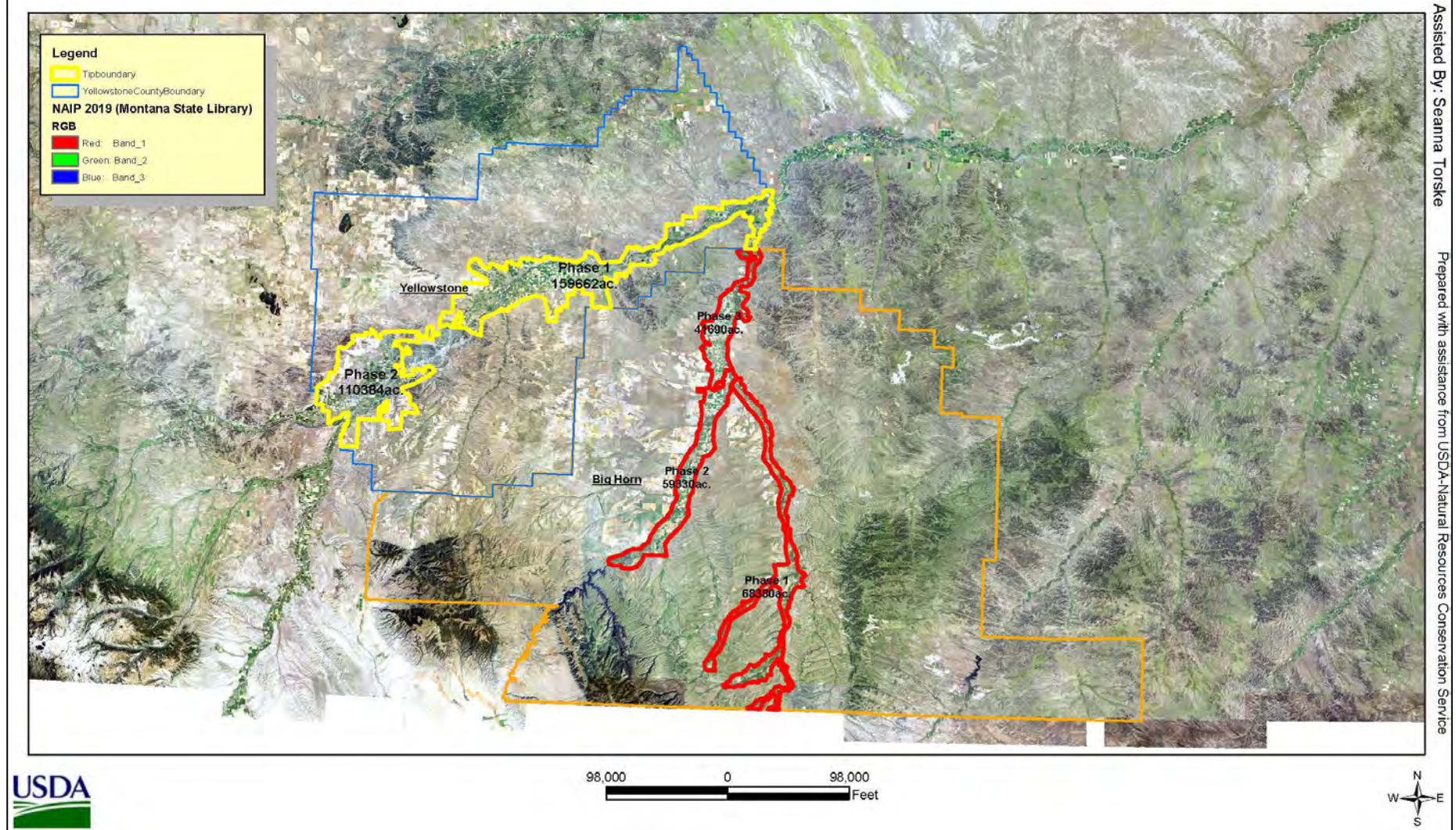


Figure 5.2 - TIP Phase 1 Project Area with Mapped Apiaries Listed

Yellowstone County, MT
Big Horn County, MT

Yellowstone and Big Horn County "Sister" TIP Phase Areas

Agency: USDA-NRCS
Field Office: Billings & Hardin



Assisted By: Seanna Torske
Prepared with assistance from USDA-Natural Resources Conservation Service

Figure 5.3 - Map showing the "Sister" TIP Proposals in Yellowstone and Big Horn Counties. Phase 1's from both counties are being submitted for FY24 consideration, and future phases will be applied for in later years. Full implementation of all phases will connect the river valley corridors and will further enhance the pollinator habitats in both counties.