Windmill Reduction Act

Phillips County

Submitted by:
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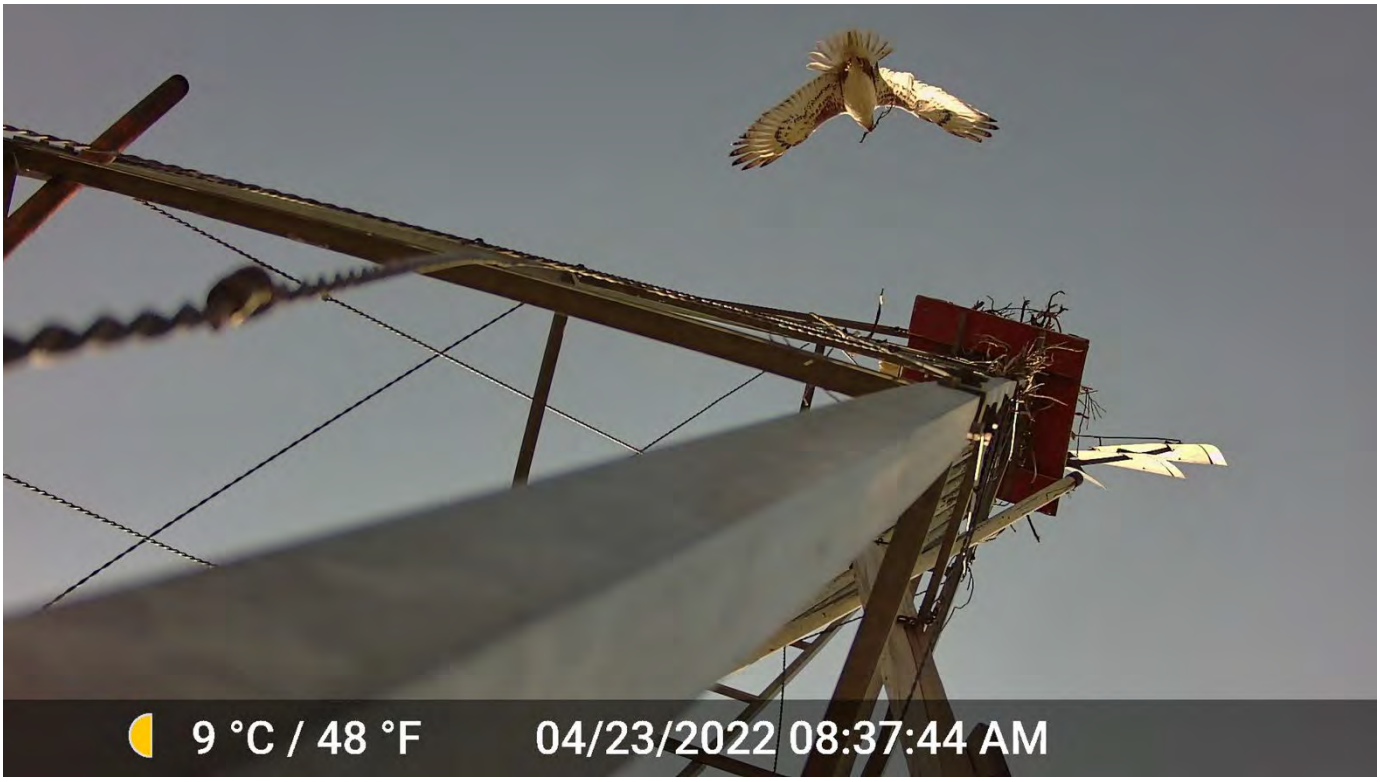
Malta Field Office
FY2024-2026



Ferruginous Hawk adding a stick to a nest located on a nonfunctioning windmill in Phillips Co. 2022.

Targeted Implementation Plan Summary

Location: Rangeland and pasture in Phillips County
Goal: Improve livestock water dependability and restore proper grazing management, decommission nonfunctioning wells, improve grassland and upland game bird habitat security.
Problem Statement: Inadequate livestock water from poor and nonfunctioning windmill systems, windmills pose a predation risk to grassland prairie birds, maintenance is a safety concern, and nonfunctioning wells risk ground-water contamination. We anticipate the removal of 41 windmills across Phillips County replacing them with solar pumps.
Resource Concerns: Inadequate Livestock Water quantity, quality and distribution and nutrients transported to groundwater and terrestrial habitat for wildlife and invertebrates grassland and upland bird habitat security.
Budget & Timeline: Approximately $1,319,346 will be needed from NRCS for an estimated 29 EQIP contracts, each lasting 3 years to convert 41 watering systems. Sign-up will occur in FY2024-2026, carrying this Targeted Implementation Plan's (TIP) duration from 2024 to 2029.

Geographic Focus

Due to the county-wide interest and specificity of this project, the TIP boundary is proposed as county wide on pasture and rangeland land uses (Figure A). This allows for the greatest potential impact to acres while targeting existing watering systems to replace or improve their condition. This county-wide approach has holistic benefits for dependable livestock watering while secondarily addressing groundwater contamination concerns and grassland and upland game bird habitat security from a landscape scale. Upland game bird habitat security will be addressed by removing windmills used by avian predators and therefore, reducing predation risk and reducing wildlife behavior change (Kirol, C.P., K. T. Smith, N. E. Graf, J. B. Dinkins, C. W. Lebeau, T. L. Maechtle, A. L. Sutphin, and J. L. Beck. 2020. Greater Sage-Grouse response to the Physical Footprint of Energy Development. The Journal of Wildlife Management 84(5):989-1001.) Priority areas have been identified using a two mile buffer of grouse leks and the core habitat areas of priority grassland bird species, the more overlap of core habitat areas adds higher priority (Figure B).

Figure A. TIP Boundary Map

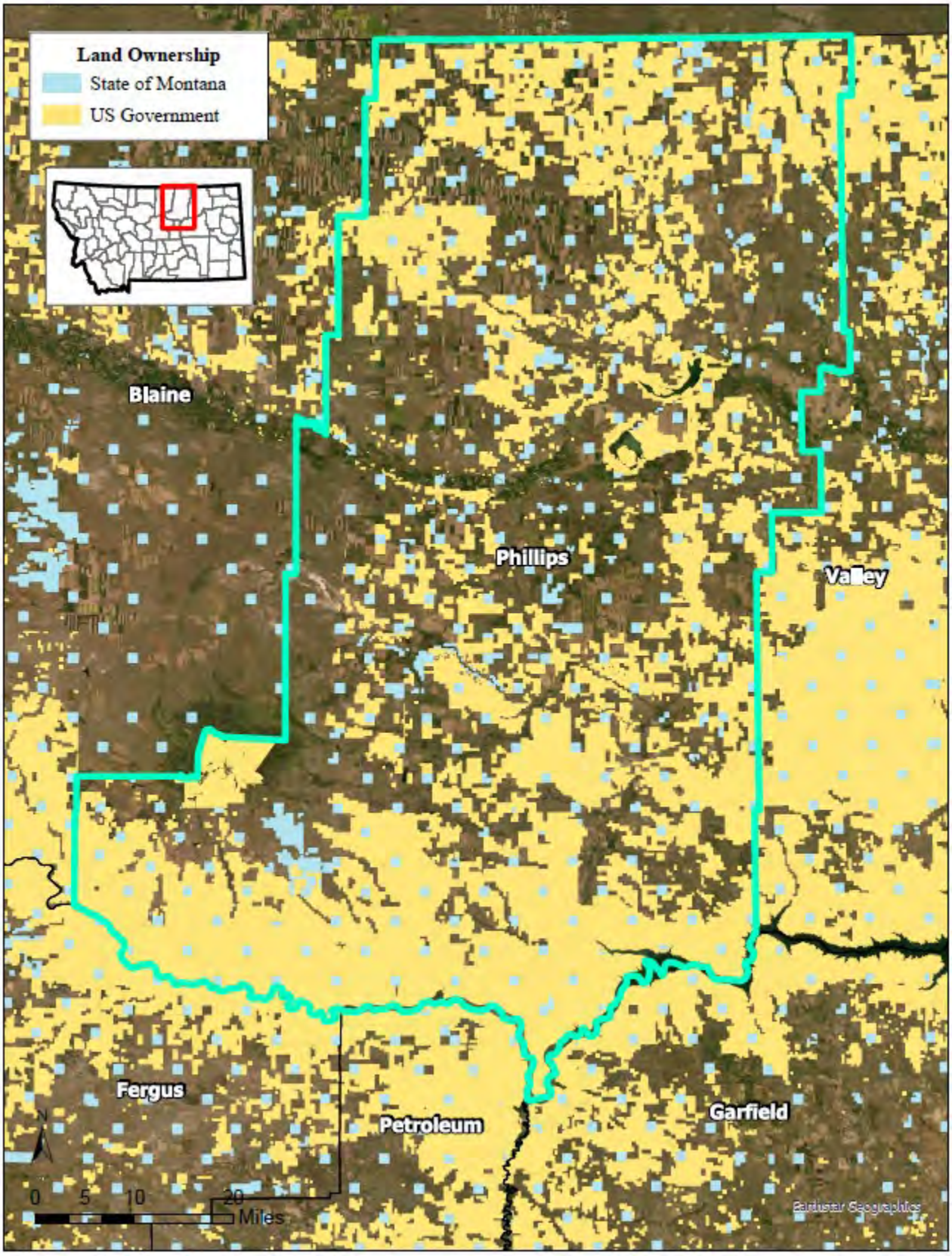
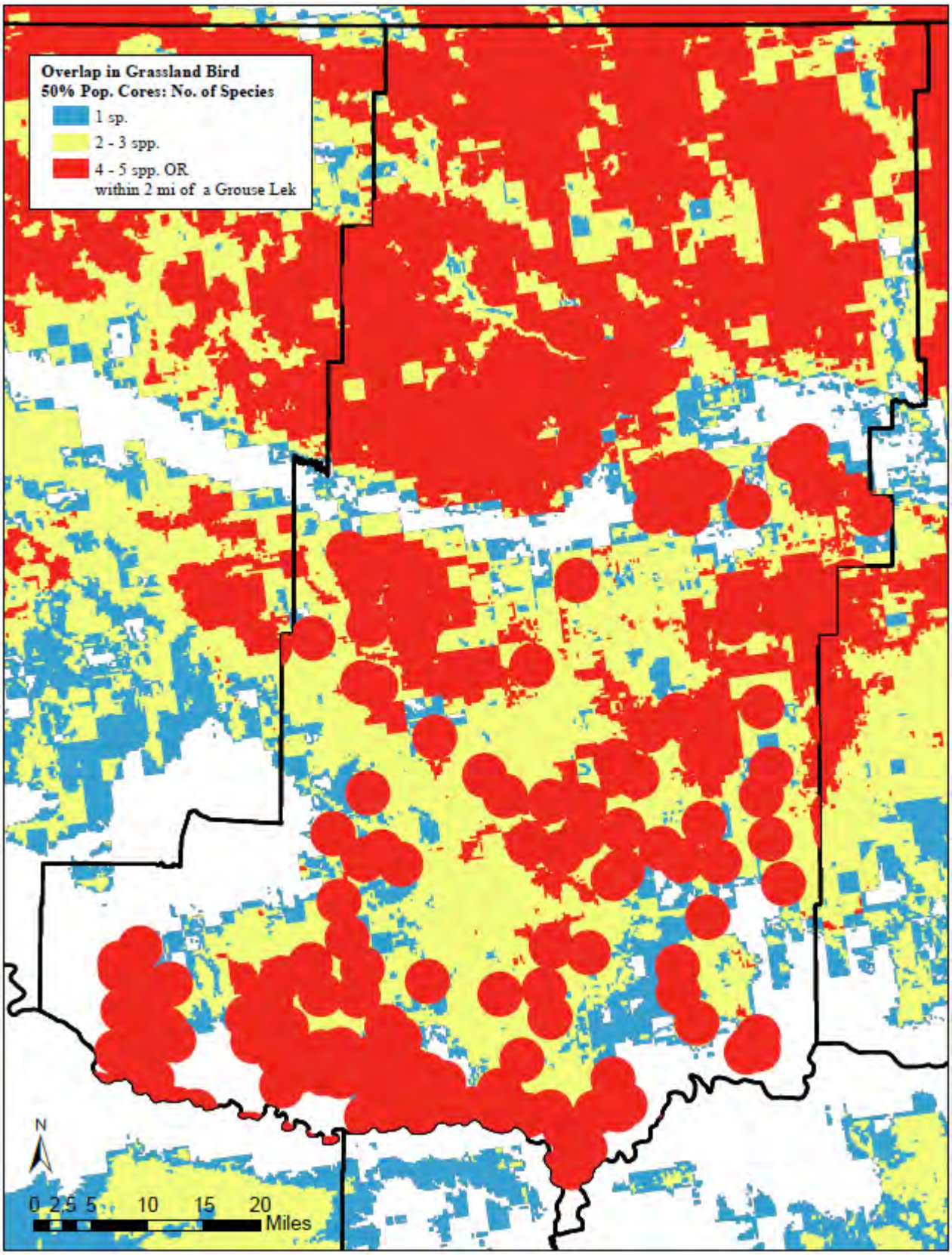


Figure B. Grassland Bird Habitat Map



Resource Concern

Phillips County is cattle-producing country, with as much as 63% of the land use categorized as range and pastureland. The main methods to supply water to the county's livestock have been through the construction of reservoirs and well-drilling. Wells drilled away from grid power throughout the 1900s were fastened with windmill-powered pump systems. These remote wells have been crucial for improved livestock grazing distribution and utilization. However, Phillips County producers have expressed personal safety and maintenance concerns for working on windmill-powered systems. Installed windmills require maintenance in the form of parts and lubrication. Issues with declining availability of repair parts supply and safety concerns have left many windmill-well sites non-functioning and abandoned. These abandoned well sites, whether functioning or non-functioning, leave the groundwater vulnerable for contamination. Contamination can include nitrates or sulfates that lead to public health concerns. Additionally, it is typical to have lower average windspeeds accompanying high summer temperatures in July and August when livestock watering demands are at their peak (average windspeed 5-7 mph, 2018-2022, MT AGRIMET Malta). The resource concerns addressed in this TIP are inadequate livestock water quantity, quality and distribution, risk of nutrients transported to groundwater, and terrestrial habitat for wildlife and invertebrates—grassland and upland bird habitat security.

In Phillips County, "Stock water" is cited as the number two priority resource concern (Page 69, Phillips County Long Range Plan 2020). NRCS and county partners have been working to address the livestock watering and surface water quality concerns through a variety of projects—ensuring the future of working grasslands in Phillips County for livestock owners and wildlife. However, recent years of drought conditions have continued to create stress on land resources and producers. The inherent stress caused by drought on land resources has often been escalated in areas with limited or undependable water availability resulting in poor livestock distribution and uneven use of forage. Addressing the distribution of grazing with watering resources is crucial for plant community health and best practice grazing management.

Phillips County contains continentally important habitat for grassland songbirds and prairie grouse (see Wildlife Conservation Values). Windmills and other tall structures artificially increase predation rates on grassland bird species, waterfowl, and migratory waders by serving as perches for avian predators. The grassland bird species included are the four priority kinds: Baird's Sparrow, Chestnut-Collared Longspur, Sprague's Pipit, and Thick-Billed Longspur. Over 60% of Sharp-tailed Grouse and Greater Sage-grouse leks in Phillips County are located within 2 miles of a well, many of which are associated with windmills. Known or suspected predators on lekking adult greater sage-grouse include golden eagle and prairie falcon, and black-billed magpies and common ravens are nest predators (Montana Field Guide, retrieved on January 5, 2023).

Goals & Objectives

The goal of this TIP is to improve dependable stock water availability through the objectives of removing and converting windmill systems to provide for more dependable water. This will also support increased grazing flexibility and livestock distribution. This project also addresses nutrient transport risk at open wells through well decommissioning and habitat improvements for upland and grassland birds from a landscape perspective by removing manmade predator perches.

Proposed Alternatives

No Action

This alternative will not provide reliable water to livestock, negatively affecting distribution, utilization, and overall rangeland health and producer flexibility. Rangeland pastures that have not been utilized due to non-functioning windmills will continue to be underutilized, benefits of grazing for the plant community and bird habitat will not be present. This action also leaves windmills as perches on the landscape, contributing to higher risks of predation on grassland, waterfowl, and upland game birds. The perches not only affect bird predation risk but distribution and behavior of populations, presenting cascading effects to feeding, brooding, and reproductive habits. Non-functioning and functioning windmills will remain on the landscape and the risk of contamination to groundwater quality will persist.

Alternative 1

An alternative not selected includes assistance solely on private lands to remove windmill infrastructure and convert the system to a solar, generator, or grid powered pumping system. Assistance to provide livestock water with a watering tank and storage tank to meet NRCS standards is also available in this alternative. Nonfunctioning wells will be decommissioned to eliminate groundwater contamination risks. New wells will not be drilled in this scenario, making for a simpler project but does not fully address the primary resource concern. Partner contributions with solar panel bird deterrent strips from ABC Birds is included in this alternative's action plan. Partner contributions from FWP's Migratory Bird funding program is also available to producers to increase infrastructure for the benefit of migratory birds. The project boundary for this alternative was proposed to target north or south Phillips County.

Alternative 2

The selected alternative of this TIP includes assistance, on both public and private lands, to remove windmill infrastructure and conversion to a solar, grid, or generator powered pumping system. Bird deterrent strips will be placed on the solar panels by the American Bird Conservancy to reduce the use of the new solar system as an avian predator perch. Watering tank and storage tank installation will be installed to meet NRCS standards for adequate water. Livestock pipelines will be used sparingly in situations that require a new well to connect to an existing tank and/or new storage tank, or to address vulnerable environmental resource concerns (i.e. riparian area). Nonfunctioning

wells will be decommissioned by a certified well driller and the potential for assistance to drill a replacement well is available. A new well's drilling location is restricted to service the grazing boundaries previously supplied by the decommissioned well if the geology report is favorable. Existing watering tanks will be retrofitted to be wildlife friendly with escape ramps.

Compliance considerations for windmill removal and conversion on public lands will be addressed by the respective land management agency. Windmill systems on public land will be evaluated by BLM and Malta Field Office staff on a case-by case basis to determine feasibility and documentation demands such as NEPA, water rights, and storage capabilities. On private land, the NRCS will conduct a cultural resources field review and other reviews required for environmental compliance. Windmill structures older than 50 years may require additional coordination with SHPO to determine proceeding steps of removal. Migratory Bird Protection Act will also be adhered to, removing nests outside of the primary nesting season (April 15 - August 1) unless monitored and identified as an endangered species (Endangered Species Act) or bald and golden eagle (Bald and Golden Eagle Protection Act).

Assistance for monitoring may be available for producers who have existing experience with monitoring and are interested in applying more advanced monitoring techniques and analysis to their adaptive management practice. Producers can apply to enroll in World Wildlife Fund's Ranch System and Viability Planning (RSVP) program. Interested producers will be provided an informational pamphlet that includes program details, a contact, and benefits for both rancher and wildlife. Producer projects within, and outside of, the 10+ breeding pair category in the MT Thunderstorm Map can work with Montana Fish Wildlife & Parks to install additional infrastructure through the Migratory Bird Program if the project will benefit migratory birds.

This preferred alternative was chosen over the other alternative because it not only addresses resource concerns of inadequate livestock water and predator perching, but also provides additional resources to improve the TIPs flexibility for projects and addressing resource concerns in a more holistic manner. This approach includes: replacing nonfunctioning wells, addressing watering infrastructure on public lands, and retrofitting existing water tanks to make wildlife friendly. The chosen alternative may be applied on both public, being BLM and State lands, and private land for eligible projects and provides partner support of avian deterrent strips. The chosen alternative's boundary is range and pasture land uses county wide, this was chosen over a targeted geographic approach because of the land uses' distribution and contractor demand will persist countywide if one TIP proposal is done north the first year followed by an identical TIP done in south Phillips County. The partner participation opens the door for future collaboration and this alternative also addresses livestock watering distribution and subsequent resource concerns to maximize treated acres from a holistic operation perspective by including public and private land eligibility.

Conservation Practices Needed:

- 224 – Aquifer Flow Test
- 351 – Well Decommissioning
- 355 – Groundwater Testing
- 500 – Obstruction Removal
- 516 – Livestock Pipeline
- 533 – Pumping Plant

- 614 – Watering Facility
- 642 – Water Well
- 649 – Structure for Wildlife

Implementation

Project Timeframe

Summer/Fall 2023 – Sign-up #1 for FY 2024

- 7 contracts for 10 systems for FY2024, inventory windmills summer/fall of 2023 and work on contracting inventoried windmills winter of 2023 and spring of 2024.

FY2024 – Sign-up #2

- Accept new applications for FY2025, projected 12 contracts for 16 systems. Inventory and contract the Sign-up #2 applications.
- Continue work on systems previously contracted.

FY2025 – Sign-up #3

- Accept new applications for FY2026, projected 10 contracts for 15 systems. Inventory and contract Sign-up #3 applications.
- Continue work on systems previously contracted.

2026 – 2028 Implementation

- Wrap up work on contracted systems. Evaluate TIP outcomes.

Contract Planning Examples:

	Private Ground	Private Ground (replacement well)	Public Land (BLM or State)
1st year	224 Aquifer Flow Test; 355 Groundwater Testing; 500 Obstruction Removal	224 Aquifer Flow Test; 500 Obstruction Removal	224 Aquifer Flow Test; 500 Obstruction Removal
2nd year	533 Pumping Plant; 614 Watering Facility; 516 Livestock Pipeline (if needed)	351 Well Decommissioning; 642 Water Well; 355 Groundwater testing; 224 Aquifer Flow Test	351 Well Decommissioning (if needed); 533 Pumping Plant; 614 Water Facility
3rd year	—	533 Pumping Plant; 614 Watering Facility; 516 Livestock Pipeline (if needed)	—

Publicity & Outreach

- Phillips County Conservation District—meetings, newsletter, and website pages
- Farm Service Agency—newsletter and direct mailing
- Ranchers Stewardship Alliance—partner outreach networks and meetings
- Phillips County Newspaper—TIP announcement and sign-up details

Signup

Signups will be held in summer/fall of 2023 for fiscal year 2024 and sign ups in fiscal years 2025 and 2026. By allowing for county-wide signups for three years, it provides producers with a flexible timeframe to become aware and informed of the project and have ample time to apply after consideration. Based on 2022 field work and conversations, it is likely to receive 6 applications for 7 windmills in the first year.

Upon signup, NRCS staff will follow-up with the producer to draw grazing unit boundaries pertaining to the windmill and project locations on a map. Livestock numbers and season of use will also be recorded to complete the ENG-20 form. Any previous knowledge pertaining to the well will be collected from the producer at that time (i.e. windmill installation, well production history, etc.).

Inventory & Planning

Inventorying on private land will include one site visit to document windmill information and surrounding infrastructure. Maps with the windmill and associated grazing boundaries and other watering sources will be drawn on this visit as well. The Malta Field Office has engaged in consultation with the NRCS State Archaeologist to evaluate the documentation needed for systems contracted on private lands. If a tank is present at the windmill and well site, the condition will be documented and declared functioning or non-functioning based on engineering-provided criteria. The existing watering facility can be retrofitted with wildlife ramps.

If a well and windmill is located on public lands, the land management agency will be notified, and the site will be investigated by said agency to ensure the existing windmill or project location is not historically significant. Environmental compliance reviews for projects needing additional water storage facilities on public lands will be completed by the respective land management agency. The BLM will provide a Cooperative Working Agreement for each project installed on BLM land. Interested producers with a public lands windmill will also sign a NRCS Consent of Release form for project implementation. Existing bird nests be evaluated for use and BLM wildlife policies will be applied in this instance. If the existing well is declared as non-functioning on public lands by the well driller, a new well will not be drilled. The non-functioning well will be decommissioned, and the producer may still obtain funds for Obstruction Removal of the windmill.

Following contracting, if the existing well is declared as non-functioning or inadequate by the aquifer flow test on private land, a new well will be installed and an additional aquifer flow test will be planned with the new well. Contracts with a non-functioning well will include the well decommissioning process.

Contracting Considerations

Currently, Phillips County has two primary well-drillers who also install pumps and are contracted for maintenance. Due to contractor demand and recent uncertainty for solar setup and watering equipment—each contract will have three years to complete their project.

Work Unit staff have appropriate job approval authority for applicable practices. Contracted projects

with new wells will require a geology report from the State Geologist. Engineering staff will assist with interpreting pumping results and ensuring the ENG-20 is used correctly for tank/storage and pump recommendations based on livestock demand.

Windmills on public lands (BLM & State) will require additional information from the producer such as water rights documentation. Collaboration between NRCS and BLM staff on meeting water storage requirements will also need to be assessed on an individual basis.

Contracted systems will be planned with the majority of available practices and modified based on the results of the aquifer flow test to include applicable practices. The included budget materials are based on predicted contract needs following the aquifer flow test.

Financial Assistance and Budget

Budget Table by System Type.

Cost estimates based on 2023 EQIP payment schedule.

Practice Code and Description	**Without New Well** *(22 systems)*	**With New Well** *(14 systems)**	**Already Converted** *(5 systems)*
500. Remove existing windmill (~36 ft²)	$442.44	$442.44	$442.44
224. Aquifer Flow Test	$1,420.29	$2840.58 (x2)	—
642. Drill new well**	—	$18,288.00	—
533. Install pump (ex. solar system)	$6,303.13	$6,303.13	—
614. Install watering facility (2,000 gal)	$5,180.00	$5,180.00	—
AND/OR storage tank (10,000 gal)***	$12,000.00	$12,000.00	$12,000.00
355. Groundwater Testing	$286.45	$286.45	—
351. Decommission old well	—	$1,689.00	$1,689.00
516. Livestock Pipeline (150 ft)	$457.50	$457.50	$457.50
649. Structure for Wildlife (2 ramps/tank)	$185.50	$185.50	$185.50
TOTAL PER SYSTEM	$26,275.31	$47,672.60	$14,774.44
CONTRACT TOTALS	$578,056.82	$667,416.40	$73,872.20

* Based on a similar TIP in Prairie County, approximately 1/3 of windmills require new wells to be drilled
** Well depth estimations of 300 ft based on 2019 Phillips County Geology Report by Kari Scannella referenced in Phillips County Long Range Plan 2020 (pg. 69)
*** An average of 200 head per pasture was used to calculate storage needs

Total Investment to fund the entirety of the TIP: $1,319,346

Approximate EQIP Funds by Fiscal Year				
Fiscal Year	Contracts (No.)	Systems Contracted	Budget by system:	Yearly Total
2024	7	10	$26,275.31 (x6)	$410,789.30
			$47,672.60 (x5)	
			$14,774.44 (x1)	
2025	12	16	$26,275.31 (x8)	$478,114.36
			$47,672.60 (x5)	
			$14,774.44 (x2)	
2026	10	15	$26,275.31	$430,441.76

			(x8) $47,672.60 (x4) $14,774.44 (x2)	
2027	-	-	-	-
2028	-	-	-	-
TOTALS:	**29**	**41**	**-**	**$1,319,345.42**

Partnerships

Partners providing assistance include: Phillips County Conservation District, Bureau of Land Management, State of Montana, and Phillips County Newspaper. Other assistance, as follows:

- **World Wildlife Fund** has partnered to offer their RSVP monitoring services for producers who are interested in advancing their existing monitoring through adaptive management that relies on the ranch's collected data. Additional financial assistance is also possible through RSVP enrollment.
- **Montana Fish, Wildlife, & Parks** has partnered to offer additional infrastructure and financial assistance through their Migratory Bird Program to interested producers within, and outside of, priority waterfowl nesting areas (10+ breeding pairs, MT Thunderstorm Map).
- **Bureau of Land Management Malta Field Office** has partnered to provide technical service to complete projects on public BLM lands. The local BLM is not able to commit to contributing funds, funding may be available on a case-by-case basis.
- **Prairie Pothole Joint Venture (PPJV)** has provided research assistance and mapping to identify and create ranking criteria.
- **American Bird Conservancy (ABC)** has partnered with the NRCS to provide bird deterrent strips to place on solar panels through grant funds. ABC has also provided game cameras to track avian predator use of windmill structures through the 2022 field season, predator species were observed on windmill structures. More results to be analyzed from camera use and results from a similar game camera monitoring project in South Dakota.
- **Ranchers Stewardship Alliance (RSA)** will be applying for grant funding in March of 2023 for $200,000. This grant pertains to grassland restoration and enhancement to support this TIP's efforts.

Outcomes

Successful delivery of this TIP will involve the assessment of adequate water delivery by solar systems or generators to the affected grazing acreage, ensuring water supply meets or exceeds the water demand of the herd. The value of this project provides improved grazing management

opportunities and better forage utilization for ranch resiliency and the community services ranches provide. Treated acres from a livestock production and forage utilization aspect will vary is predicted to serve a mile radius. Fully successful implementation will involve removing at least 75% of the windmills inventoried from Phillips County. Previous estimations for treated acres in relation to avian predators is a ¼ mile radius from the windmill, of the windmills inventoried 75% of the treated acres will show improved grassland and upland bird habitat. Habitat to support robust and healthy wildlife populations are of benefit to rural communities and related enterprises.

Among the anticipated TIP outcomes are: increased sources and dependability for livestock watering; decommissioning of non-functioning, vulnerable groundwater wells; and removal of potential avian predator perching sites.

Outreach and education will continue upon completion of the TIP, not only to evaluate the success through participant feedback, but to encourage producers who do not have previous contracting history with NRCS to consider future projects and educational opportunities.

Ranking Questions

Application screening will be done using the current year program screening bulletin when it becomes available.

The following questions will be used to rank the applications:

1. **Will the contracted practices provide dependable water within the fenced pasture that contains the windmill?**
    a. Provide dependable water when none exists in the pasture
    b. Provide dependable water when a reservoir exists
    c. Provide dependable water when a stream/river exists
    d. Provide dependable water when an existing tank is present
2. **Based on the Prairie Bird Habitat map shown in Attachment B, what habitat priority area is the planned system improvements in?**
    a. Red (4+ species present OR within 2 mi of grouse lek)
    b. Yellow (2-3 species present)
    c. Blue (1 species present)
    d. White (0 species present)
    e. Windmill(s) not removed
3. **Will an old well be decommissioned?** *(Points only awarded if system has already been previously converted. Decommissioning an old well reduces groundwater contamination risk.)*
    a. Yes
    b. No
4. **Will the existing, functioning watering facility be retrofitted for livestock and wildlife safety?**
    a. Yes
    b. No
    c. No watering facility exists at the windmill (10 points)
5. **Are 100% of the operation's eligible windmills offered for contract?**
    a. Yes
    b. No
6. **Will the windmill(s) be removed?**
    a. Yes
    b. No

APPENDIX - Wildlife Conservation Values

The TIP project area contains continentally important habitat for wildlife, including many priority bird and big game species (MTFWP 2015, PP JV 2017). Phillips County is located on the western half of the Prairie Pothole Region (PPR), the most important region for breeding waterfowl in North America, and at the center of the Northern Shortgrass Prairie ecoregion (Dinerstein et al. 2017), which contains nearly a third (32%) of the remaining intact grassland in North America (7% of the world; Scholtz and Twidwell 2022; Fig. Al). Although less than 3% of the U.S. PPR is contained within the county, Phillips County accounts for over 5% of the remaining grassland in the U.S. PPR and 8% of its potentially undisturbed (never-tilled) grassland (Fields and Barnes 2019); for this reason, Phillips County supports the most uplandnesting duck pairs of any county in the Montana PPR (17%, > 100,000 pairs; Fig. A 2). The northern two-thirds of the county is part of one of the largest remaining tracts of grassland in the Great Plains, which extends from Blaine, Phillips, and Valley County, Montana northwest into Alberta and Saskatchewan (Fig. Al). This area contains some of the highest densities of four priority grassland bird species experiencing steep population declines (54-99% of 25% population core areas for Baird's Sparrow, Chestnut-Collared Longspur, Sprague's Pipit, Thick-Billed Longspur) and supports high grassland bird species richness (Fig. A3), making it one of the most important areas for grassland birds in North America. The southern third of the county consists of important sagebrush steppe habitat, containing 12% of Greater Sage-Grouse core habitat and 10% of Elk wintering range in eastern Montana (Fig. A4). Phillips County also supports key migratory corridors and wintering habitat for Mule Deer and Pronghorn (7% and 13% of eastern Montana wintering range, respectively) and substantial numbers of breeding shorebirds(> 13% of county supports ?:3 priority breeding shorebird species; PPJV 2017; Fig. Al).

Addressing inadequate livestock water will allow for more active grazing management in areas that were previously unable to be or inadequately grazed, which will likely improve habitat for some priority grassland bird species (e.g., Chestnut-Collared Longspur and Lark Bunting). Improving livestock water distributions also makes more grazing land available to livestock and supports local and regional efforts for sustainable grass-based economies in these rural landscapes (Higgins et al. 2002, PPJV 2017, NRCS 2021). Replacing windmills with solar pumps with avian deterrent strips will likely decrease concentrations of avian predators, such as raptors and corvids, by removing artificial perches (O'Neil et al. 2018). Artificial perches, high densities of avian predators, or both have been shown to increase predation risk for sharp-tailed grouse (Manzer and Hannon 2005), sage-grouse (Dinkins et al. 2014), ducks (Borgo and Conover 2016), songbirds, and shorebirds (Liebezeit et al. 2009).

Addressing inadequate livestock water and improving rangeland management aligns with the goals of the PPJV 201 7 Montana State Tactical Plan, including an objective of enhancing 18,500 grassland acres through EQIP practices (PPJV 2017). The PPJV will support this TIP by providing technical assistance for evaluating outcomes via their Science Integration Specialist and financial and communications assistance (e.g., workshops, outreach) when possible.

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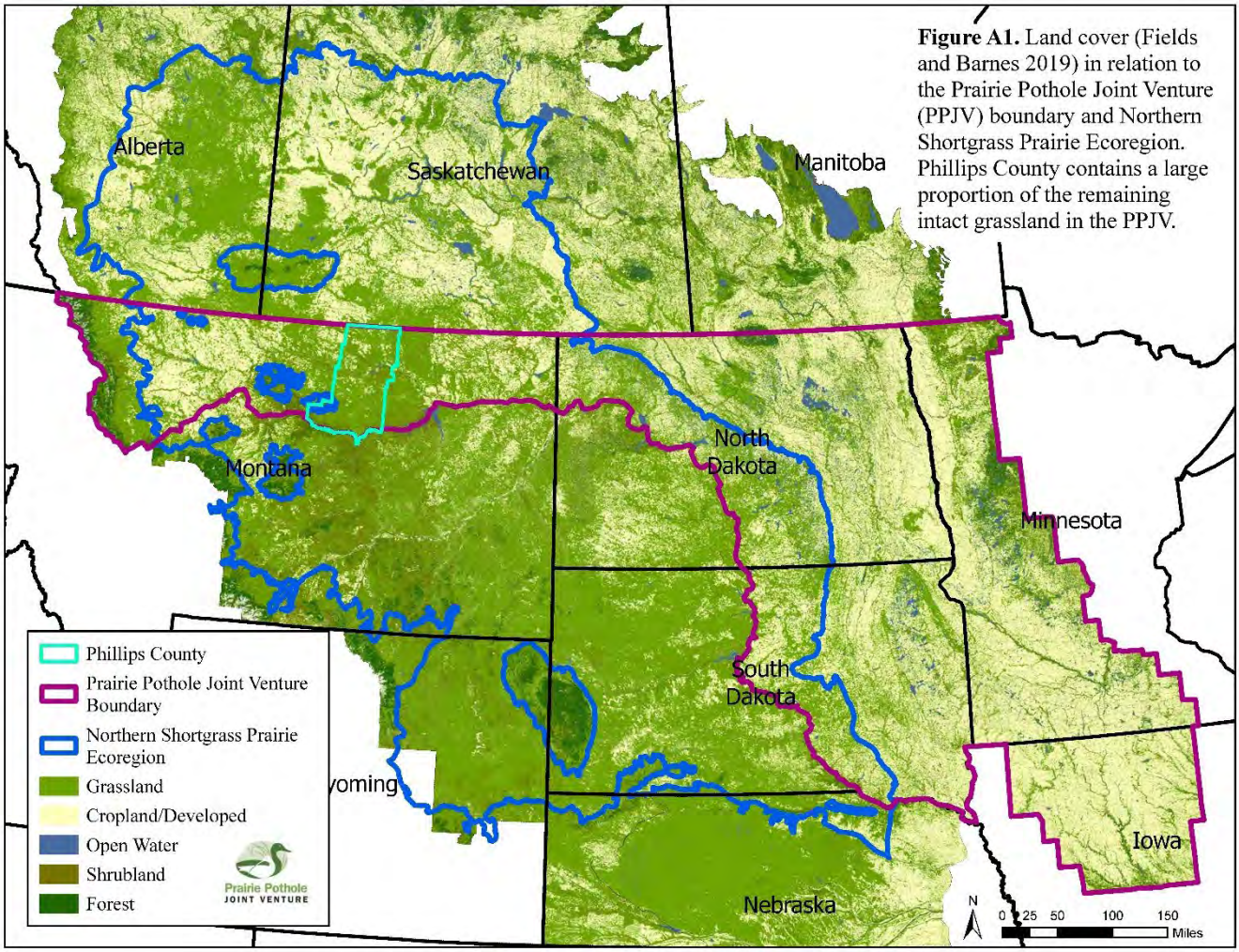

Figure A1. Land cover (Fields and Barnes 2019) in relation to the Prairie Pothole Joint Venture (PPJV) boundary and Northern Shortgrass Prairie Ecoregion. Phillips County contains a large proportion of the remaining intact grassland in the PPJV.

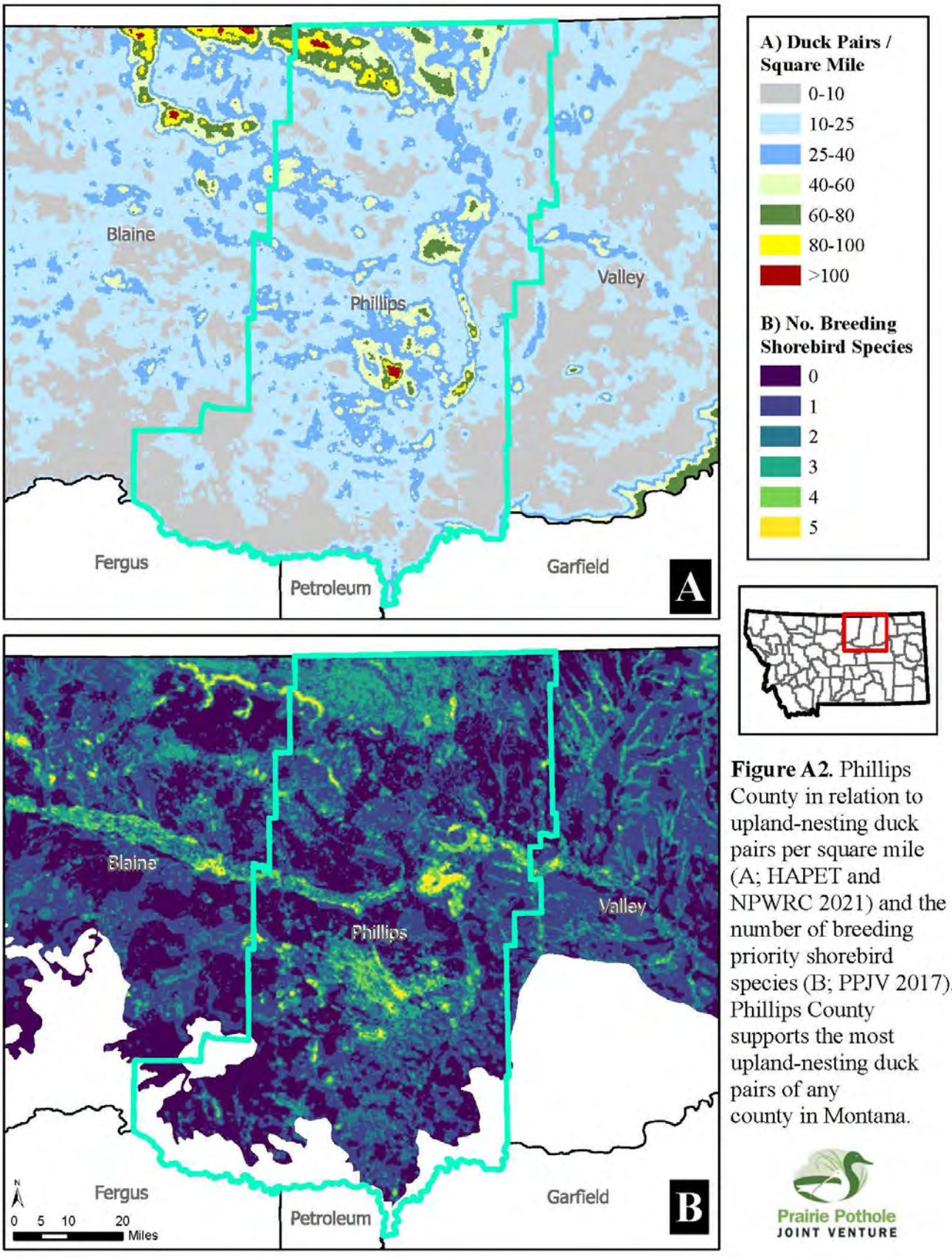

Figure A2. Phillips County in relation to upland-nesting duck pairs per square mile (A; HAPET and NPWRC 2021) and the number of breeding priority shorebird species (B; PPJV 2017). Phillips County supports the most upland-nesting duck pairs of any county in Montana.

Prairie Pothole JOINT VENTURE

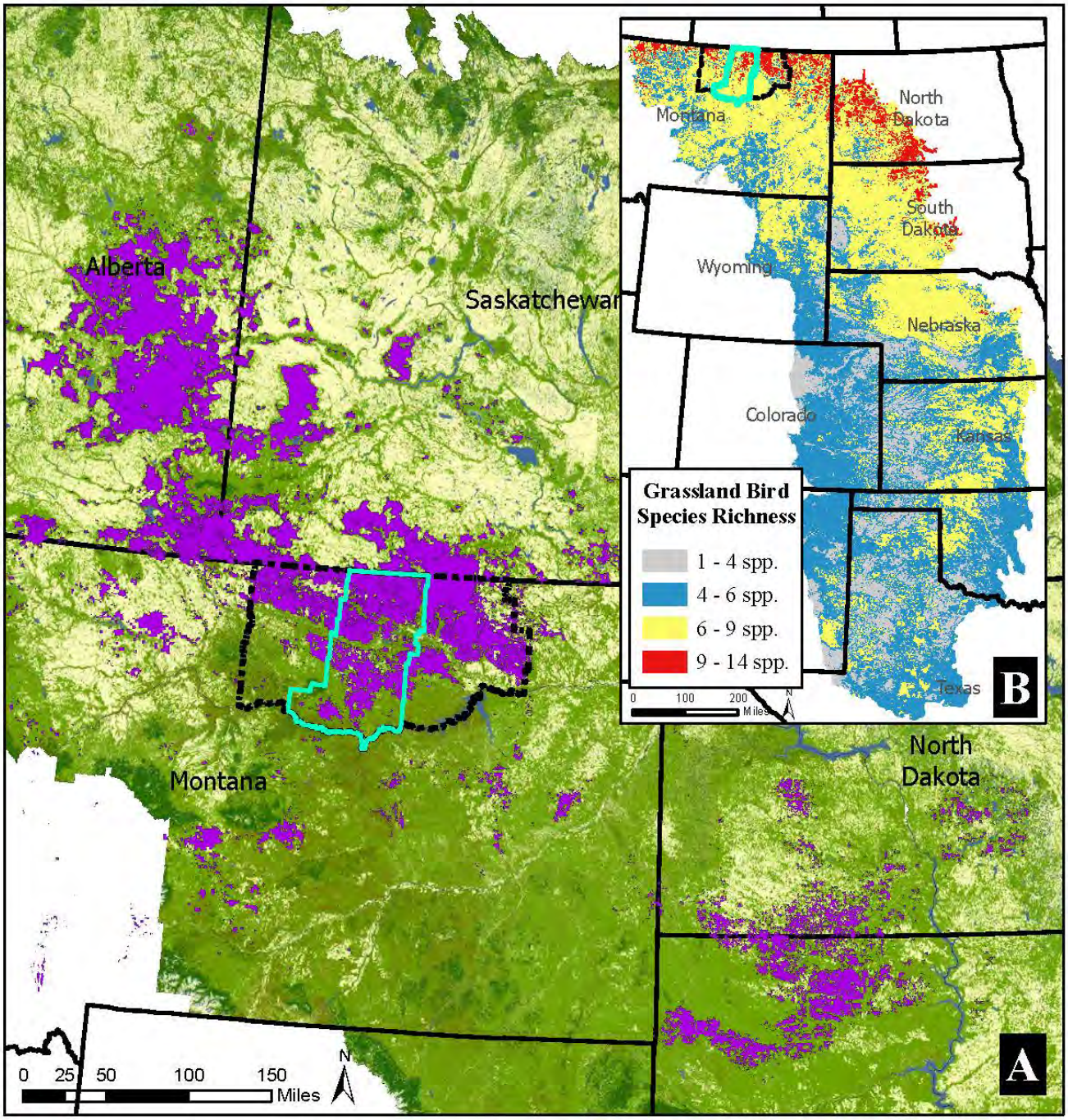

Figure A3. Land cover (Fields and Barnes 2019) in relation to the overlapped 25% population core areas (highest density) of Baird's Sparrow, Chestnut-Collared Longspur, Sprague's Pipit, and Thick-Billed Longspur (A: Barnes 2022) and grassland bird species richness in the U.S. Great Plains (B: Pavlacky et al. 2021). The majority (54-99%) of these core areas are in Alberta, Saskatchewan, and Blaine, Phillips, and Valley counties, Montana. Phillips County also supports some of the highest grassland bird species richness in the region.

Prairie Pothole JOINT VENTURE

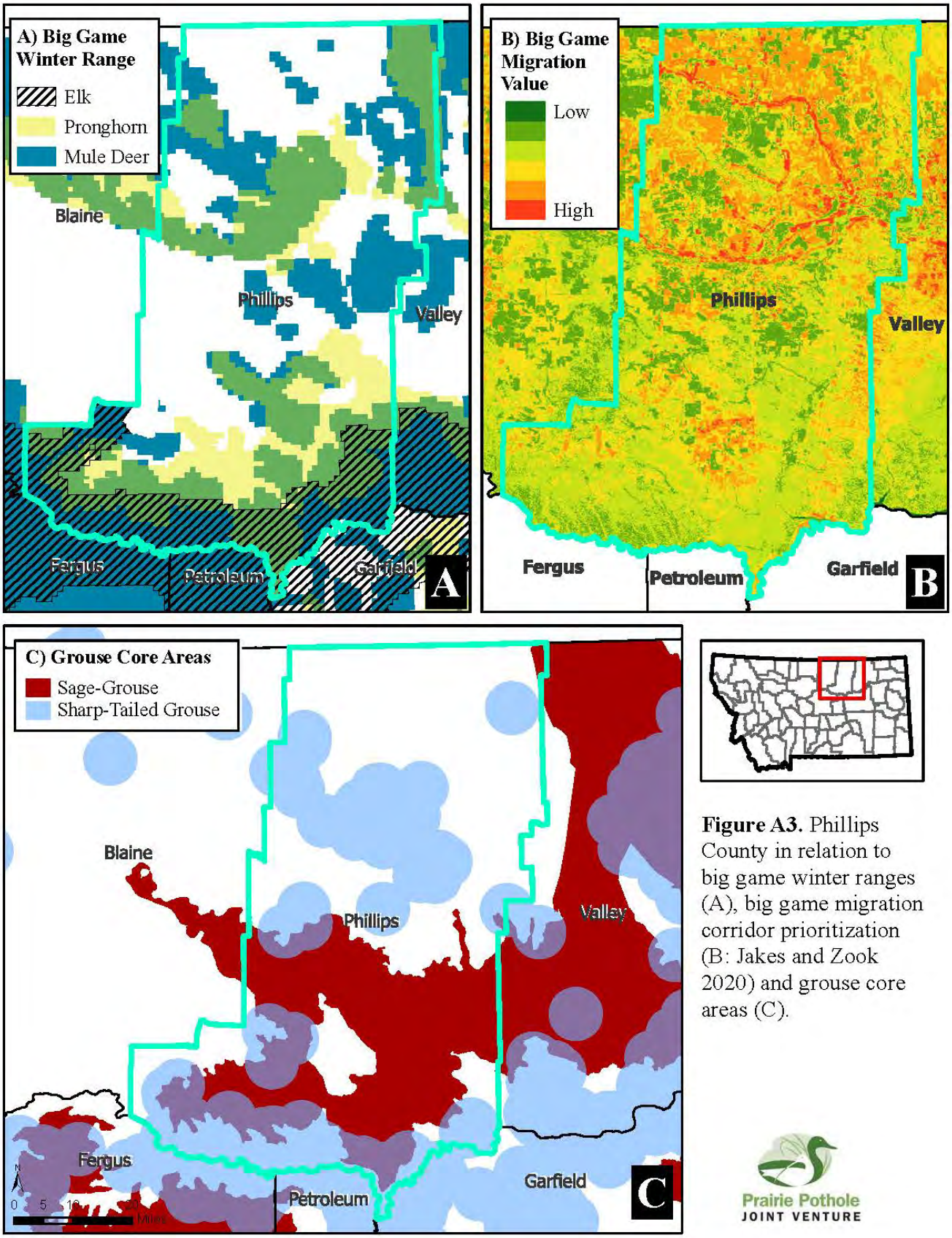

Figure A3. Phillips County in relation to big game winter ranges (A), big game migration corridor prioritization (B: Jakes and Zook 2020) and grouse core areas (C).

Prairie Pothole JOINT VENTURE