Natural Resources Conservation Service
Montana—FY2023 TIP Proposal

Pasture Improvement for Grazing (PIG)

BEN MONTGOMERY

RONAN FIELD OFFICE

Project Summary

Irrigated pasture is one of the main land uses in Lake County. The NRCS and local agricultural producers have made significant investments by installing irrigation pivots on many pastures over the past twenty years. Work completed by the Ronan NRCS Office and our partners has shown that improving grazing management on pivot-irrigated pastures can significantly boost productivity and profitability while improving soil and water quality and wildlife habitat. To maximize the opportunities for grazing improvements, electric fencing and stockwater systems are necessary. Working with over a dozen livestock producers in Lake County over the past five years has demonstrated the effectiveness that these structural practices can provide. This TIP will provide the infrastructure necessary for livestock producers to maximize the economic and ecological returns of their pivot irrigated pastures. The primary resource concern that will be addressed through this TIP is plant productivity and health. Secondary resource concerns include livestock feed and forage, and soil quality/soil health. It is anticipated that approximately ten projects will be funded each year and that the total acres treated by the end of the TIP will be 6,000. Project location will be within the Mission Valley. Total fiscal outlays are anticipated at approximately $383,000 per year for a total of $1,915,000 over five years. The local community has a high level of interest in making additional investments on their pivot-irrigated pastures and NRCS is ready to meet that need.

Overview and Background Information

In Western Montana, working agricultural land has steadily decreased over the past twenty years as farms are subdivided and sold for housing developments. In response, land prices have soared. Livestock producers have found themselves increasingly short on both pasture for their livestock and farm and ranch labor. To stay in business, producers are being forced to do more with less and maximize their production and profitability on smaller land units. As agriculture becomes more economically challenging, some producers are forced to quit the business altogether, often selling their properties to developers to make ends meet. As this process of rural development and subdivision occurs cumulatively in valleys across the intermountain West, water quality, soil health, native vegetation, and wildlife habitat are compromised. Cooperatively, we must all find ways to keep agriculture viable. This TIP proposes one way to address this need.

Maximizing production and profit on smaller acres often requires capital investment. With NRCS' help, many producers have already upgraded their irrigated pastures to pivot irrigation. It is estimated that over the past twenty years, the NRCS has assisted with the installation of over 75 pivots within the boundaries of this TIP. Pivots provide more efficient, uniform irrigation which boosts pasture yields. They also reduce on-farm labor demands – a significant benefit in today's economy. Most often, producers install pivots on their most valuable agricultural lands. These fields often have high quality soils, moderate slopes, and high production potentials. However, on pastures, even when investments are made to install pivots, productivity often falls short of its potential. In Lake County, we have learned producers can maximize productivity with relatively simple improvements to their grazing management.

Over the past decade, the Ronan NRCS Office has successfully worked with over a dozen local ranchers to improve grazing management on their pivot-irrigated pastures by developing and refining techniques that make rotational grazing easier and more effective. Grazing improvements typically entail moving animals more frequently, leaving taller stubble heights, and allowing at least 30 days between grazing events. In our experience, ranchers who follow these tenets and move animals every 7 to 10 days have realized significant benefits. Some ranchers have realized even greater improvements by moving animals more frequently (i.e., every 1-3 days). In addition to increases in pasture productivity and hay yields, converting from season long grazing (i.e., leaving animals in one pasture all growing season) to rotational grazing can significantly increase ranch profitability by improving animal health and reducing fertilizer inputs, herbicide use, and hay feeding costs in the fall and winter because there is more forage available later in the year.

Rotational grazing also provides a variety of natural resource benefits. Moving animals frequently allows for more even grazing distribution within pastures and allows pastures to rest for longer periods of time between grazing events. Because forage tends to grow taller and is left taller after being grazed, the pastures provide better carbon sequestration by building better root development and subsequently healthier soils with higher organic matter. Climate change is a top priority for the NRCS. This TIP will help meet the national goal of delivering climate change solutions by increasing carbon sequestration on our most productive grazing lands. Because irrigation and good grazing management greatly increase carbon sequestration potential (Conant et al. 2001) and lands that are grazed sequester more carbon than lands that are hayed (Franzluebbers et al. 2000), our focus on pivot irrigated pastures provides the best 'bang for the buck' for carbon storage. Other improvements to soil health include better nutrient cycling, biological activity, aggregate stability, water infiltration, and resistance to wind and water erosion. Well managed pastures provide better food and cover for wildlife including many species of ground nesting birds. In short, improving grazing rotations improves grass production, provides for healthier animals, improves ranch profitability, and leads to natural resource benefits including improved soil and water quality and better wildlife habitat.

One of the primary issues preventing producers from implementing improved grazing strategies on pivot-irrigated lands is lack of infrastructure to facilitate more intensive rotations of livestock. Necessary infrastructure often includes electric fencing (both permanent and often temporary fencing) as well as improved stockwater delivery within the newly fenced pastures. The Ronan Field Office has taken a leading role in working with conservation partners and livestock grazers from throughout Western Montana to develop simple, easy to install and manage, permanent and temporary fencing and stockwater options for grazing under center pivots. This TIP will provide for a continuation of the groundwork that has already been laid by investing in innovative and effective solutions to common grazing challenges. Figure 2 details the typical layout of fencing and stockwater for grazing under pivots that has been employed in Lake County. Thanks to advancements in materials and design, permanent electric fencing is the best solution for fencing center pivots. Electrified swing gates at each wheel track crossing allow pivots to move fluidly through the fences while at the same time providing secure livestock containment within each pasture. Figure 3 shows an alternate design option that has been employed in other locations in Western Montana with great success.

Our work has shown that when prioritizing grazing efforts on irrigated lands, the best 'bang for the buck' lies with focusing resources on pivot irrigated pastures. Pivots are the easiest irrigation system type on which to implement rotational grazing because adding permanent electric fencing to pivots is often simple, cheap, and effective. When pastures are divided into smaller paddocks, stockwater distribution is often inadequate, making improvements necessary. In many pastures in Lake County, livestock rely on water from open ditches and canals. Watering out of these surface water sources creates several problems. First, when pastures are divided with electric cross fencing, surface water is often not available in each new pasture. Second, most ditches and canals that provide surface water eventually empty into local streams and rivers, creating water quality concerns due to manure and sediment issues. And third, most surface water in these pastures is seasonal and only available during irrigation seasons. We have found that improving grazing management often allows grazers to extend their grazing seasons into the fall and winter when surface water is not available. It is anticipated that many ranches will be able to extend grazing an additional 30-90 days within their pastures in the fall. Improving stockwater within these pastures using wells, livestock pipelines, and stockwater tanks solves all three of these concerns. We design our systems so that four-season livestock water is provided in each new permanent pasture.

This TIP will focus on pivot-irrigated pastures within the Mission Valley in Lake County, including the Flathead Indian Reservation, (Figure 1). This TIP will be open to all members of the community who meet the requirements for participation in the TIP and have land within the TIP boundaries including tribal members and socially disadvantaged producers.

Irrigation delivery on the Reservation is provided by the Flathead Indian Irrigation Project (FIIP). Historically, many irrigators also used the canals and ditches of the FIIP for stockwater throughout the entire year because FIIP would regularly provide minimal 'trickle' flows throughout the service area in the non-irrigation season. However, with the passage of the Confederated Salish and Kootenai Water Compact in 2020, these trickle flows for stockwater are largely being eliminated. The lack of season long stockwater options is of great concern to many livestock producers. This TIP will assist in providing the necessary stockwater for many producers who wish to also maximize the financial and natural resource returns from their pivot irrigated pastures. This TIP will assist with new wells when suitable existing wells are not present. When present and suitable, existing wells will be used to service pipelines and tanks. All stockwater systems will be required to follow the permitting process enacted by the Flathead Reservation Water Management Board.

Figure 1: TIP Boundary

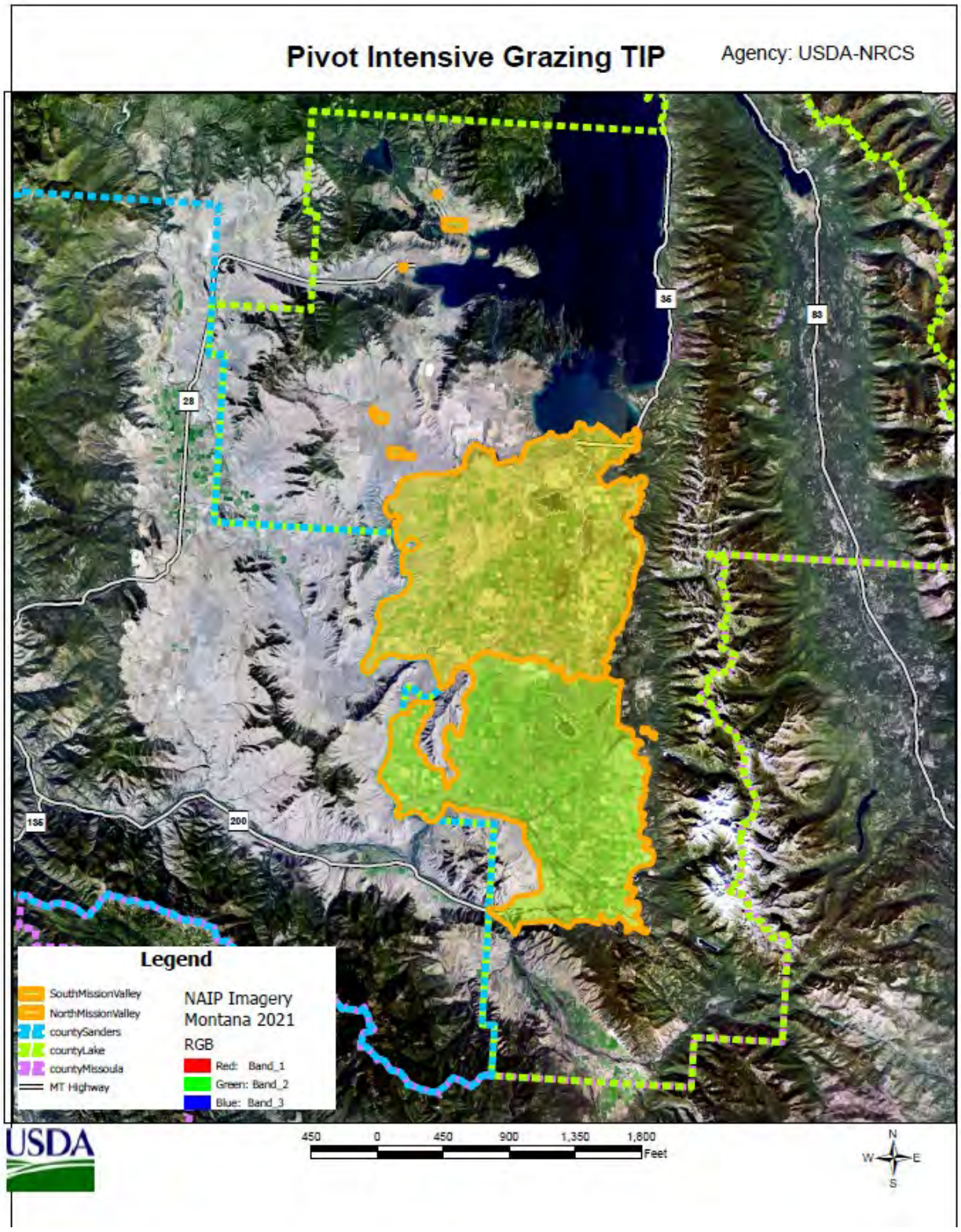

Figure 2: Typical Electric Cross-Fenced Pivot Design

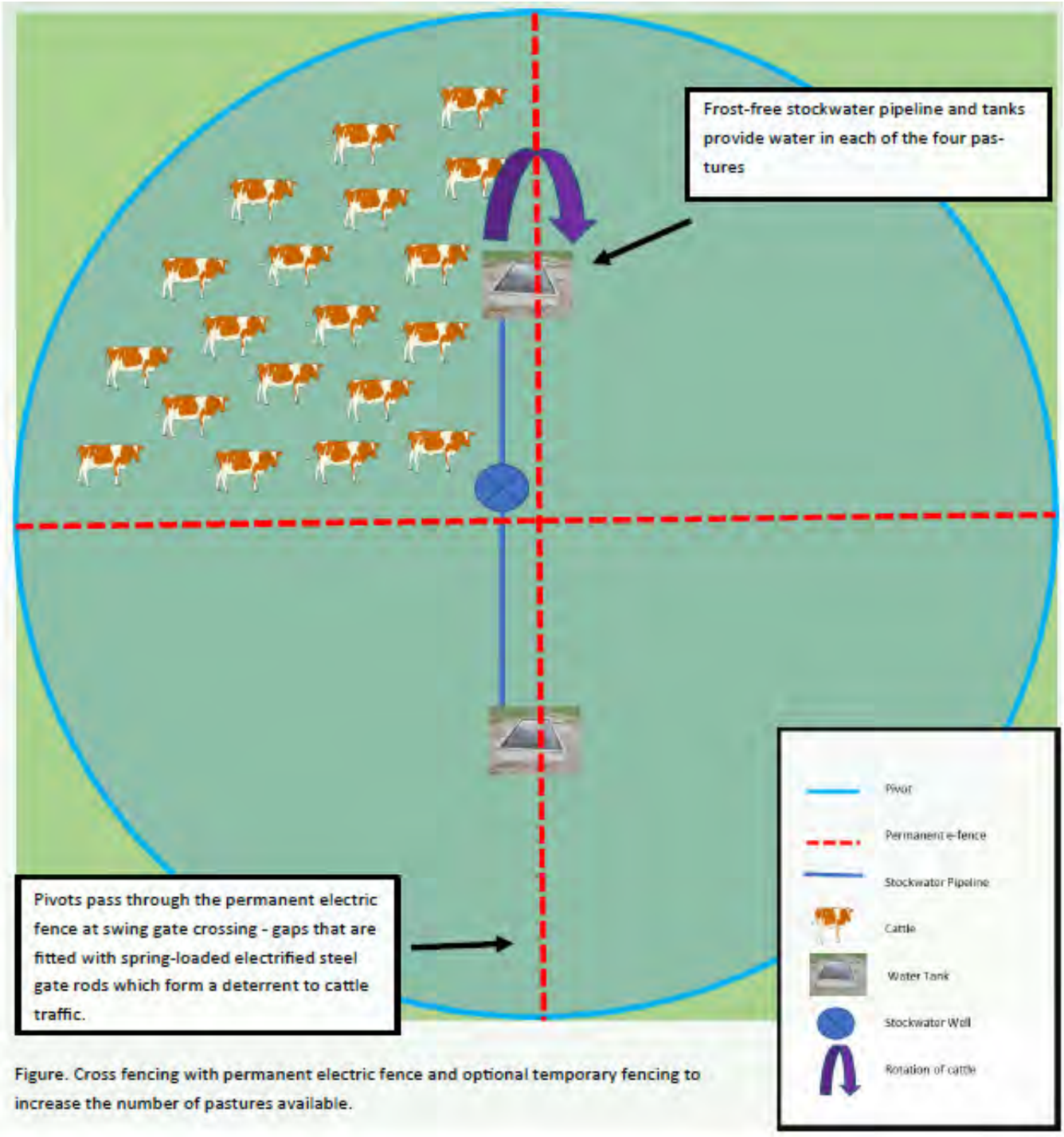

Figure 2: Cross-fence design using permanent electric fencing and a well-designed stockwater system that services each pasture. This system is best for operators who wish to move livestock between pastures every 7 to 10 days.

Figure 3: Circular Electric Cross-Fenced Pivot Design

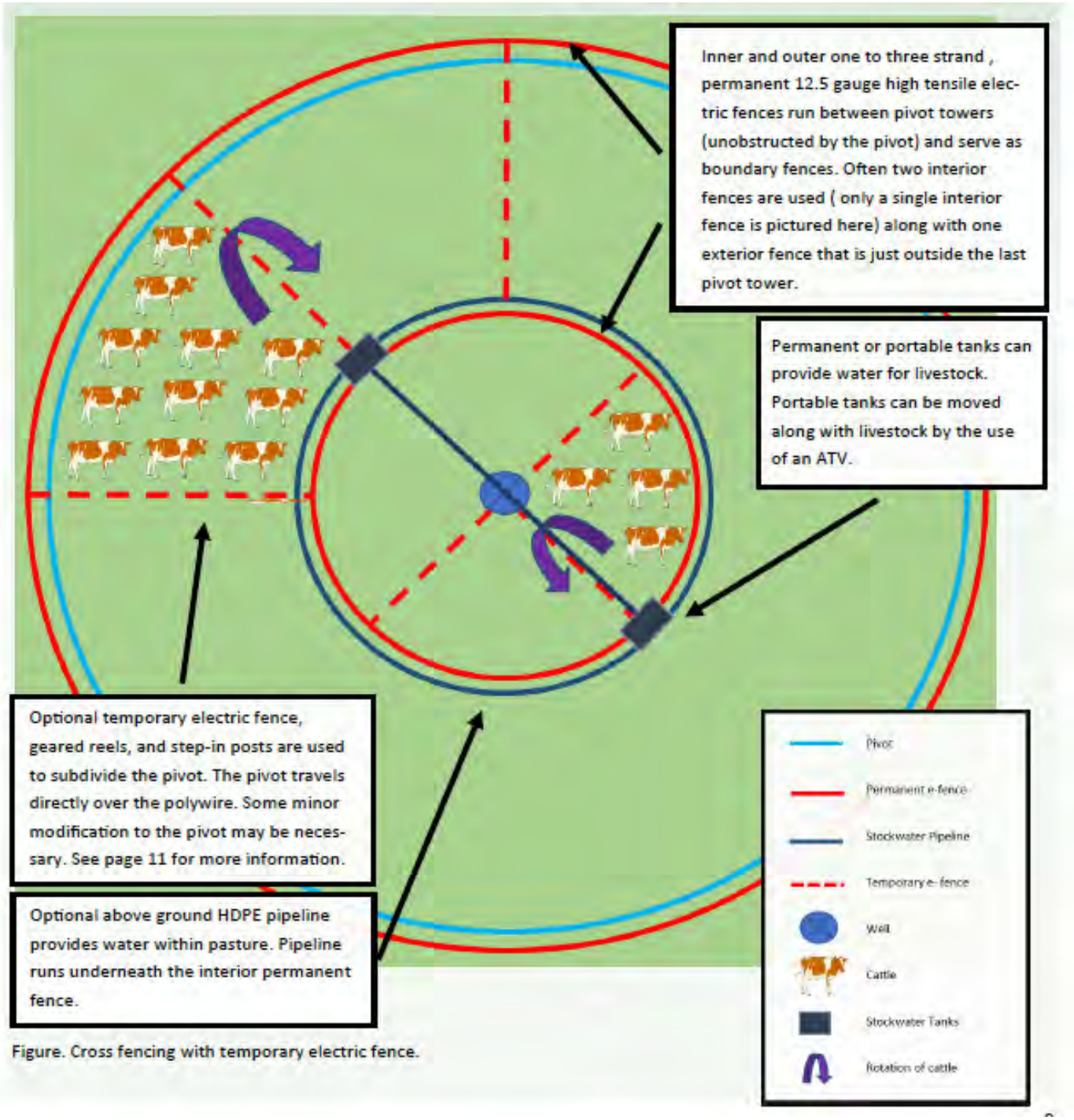

Figure 3: Circular electric fencing design with a well-designed stockwater system. This system is best if the operator wishes to further subdivide the pivot into smaller paddocks for frequent rotations.

Goals and Objectives

The primary resource concern that will be addressed through this TIP is plant productivity and health. Secondary resource concerns include livestock feed and forage, and soil organic matter.

The goals of this TIP are to maximize the productivity, profitability, and natural resource values of pastures with pivot irrigation – one of our most valuable grazing resources in the targeted irrigated valleys. This TIP has a targeted goal of treating 1,200 acres per year and 6,000 acres over the five-year lifespan of the TIP.

It is anticipated that by investing in the infrastructure on the pastures producers will progressively adopt improved grazing management strategies. Improving grazing management will lead to increased forage production, healthier soils, lower risk of surface water contamination, and improved wildlife habitat. NRCS staff and partners will monitor 10% of the pastures treated using the Montana Pasture Condition Scoresheet (MT-116A). The goal of this TIP is to improve the average Pasture Condition Score by 25% as compared to the baseline.

Proposed Alternatives and Actions

1. Alternative 1: No action will occur. NRCS will not provide financial or technical assistance to improve infrastructure on irrigated pastures. It is expected that a small number of livestock producers will make personal investments to make these improvements on their own however large-scale adoption within these areas is unlikely.

2. Alternative 2: NRCS will provide financial assistance to improve grazing infrastructure on pivot-irrigated pastures within the identified TIP boundary but only technical assistance to develop grazing management plans. This alternative was considered because most landowners in our area prefer not to enter EQIP contracts with prescribed grazing practices.

Eligible NRCS Conservation Practices (Code and Name)
642 – Water Well
224 – Aquifer Flow Test
533 – Pumping Plant
587- Structure for Water Control
614 – Watering Facility
516 – Livestock Pipeline
382 - Fence

3. Alternative 3: Selected Alternative. NRCS will provide technical and financial assistance to improve grazing infrastructure on pivot-irrigated pastures within the identified TIP boundary. The TIP will last five years from 2024 thru 2028. The selected alternative is the same as Alternative 2 except that NRCS will provide financial assistance with developing and implementing grazing management plans as an optional practice for those that are interested.

Eligible NRCS Conservation Practices (Code and Name)
642 – Water Well
224 – Aquifer Flow Test
533 – Pumping Plant
587- Structure for Water Control
614 – Watering Facility
516 – Livestock Pipeline
382 - Fence
528 – Prescribed Grazing

Alternatives will be analyzed in compliance with the National Environmental Policy Act (NEPA). All practices chosen for implementation will meet NEPA requirements. Special consideration will be given for practices affecting T/E species, such as Canada Lynx and Bull Trout, to meet all federal regulations and NRCS policy requirements. Any cultural resources present will be identified and avoided during the planning and implementation of practices involving any federal action.

Partnerships

The following partners will provide both direct and indirect assistance with this TIP:

- Pheasants Forever (PF)
- Lake County Conservation District (LCCD)
- Intermountain West Joint Venture

Pheasants Forever, in coordination with NRCS, Intermountain West Joint Venture (IWJV), and the US Fish and Wildlife Service (USFWS) jointly host a Conservation Partner Position in the Mission Valley. This position significantly improves communication and coordination of conservation efforts across thousands of acres of fractured public and private land ownership within the Mission Valley. The PF Partner Employee will provide direct on-the-ground conservation assistance to clients to assist with developing grazing management plans that complement the investments in infrastructure that this TIP will provide. In addition, the PF Partner will provide custom seed mix recommendations for clients needing to reseed pastures to maximize the benefits of infrastructure investments. PF Partner will assist in outreach and prescribed grazing for the TIP by hosting a series of Agriculture Producer Roundtable events in Lake County. These Roundtables will focus on highlighting innovative agriculture with an emphasis on soil health practices including cover crops and grazing topics. Multiple events will be held during the duration of this TIP to highlight the value of participating in the TIP and to assist in troubleshooting construction of fences and watering facilities and implementation of grazing management. A pasture improvement workshop put on by LCCD, PF and NRCS was held in March 2022 in Ronan in anticipation of this TIP and garnered significant interest in this TIP.

LCCD and the Ronan Field Office have a longstanding partnership coordinating on conservation efforts. LCCD has also committed to investing in this project by hosting and promoting outreach events and communicating with producers interested in this TIP and other NRCS program. In addition, LCCD has invested in a no-till seed drill that will be used to assist landowners in reseeding pastures through CTA which will assist in maximizing the benefits that this TIP can provide.

Implementation

The TIP will be implemented over a five-year period beginning in 2024. It is anticipated that NRCS will invest approximately $38,300 into each project assuming an average project size of 120 acres. It is anticipated that approximately 10 projects will be funded each year and that the total acres treated by the end of the TIP will be 6,000. Total fiscal outlays are anticipated at approximately $383,000 per year for a total of $1,915,000 over five years.

Table 4: Total Anticipated Acres/Year Enrolled in the TIP.

TIP Treatment Acres by Land Use	TOTAL	FY24	FY25	FY26	FY27	FY28
Acres of Pasture Planned	**6,000**	1,200	1,200	1,200	1,200	1,200

Table 5. NRCS Budget Projections, assume average cost of approximately $38,300 per project.

	FY24 Requested	FY25 Requested	FY26	FY27	FY28
Estimated FA	$383,000	$383,000	$383,000	$383,000	$383,000
Estimated Number of Contracts	10	10	10	10	10

Table 6. Anticipated Partner support provided.

Partners	Services, assets, or assistance provided
Lake County Conservation District	Outreach and advertising for TIP. Providing no-till seed drill for pastures requiring reseeding (at landowner's expense).
Pheasants Forever	Outreach, advertising, and education regarding TIP. Assistance with EQIP and CTA-based grazing plans and grazing management techniques. Custom seed mix recommendations for renovating pastures to improve productivity.

Area Office and possibly State Office Engineering staff assistance will be requested with preliminary and final design and survey and construction inspections. Anticipated Area Office Engineering staff time for each project is 40 hours. State and area office assistance will be requested in order to train FO staff and to assist with preliminary design.

Potential Ranking Questions

1. Will this project treat a full-circle, 360-degree pivot?
2. Is the pasture grazed annually, as the primary means of forage harvest in June and will this practice be maintained throughout the life of the contract?
3. Will the applicant contract an 'intensive' prescribed grazing system on the pivot that includes rotating livestock at least every three days?
4. Will this project include the development of at least four permanent pastures on each pivot under contract?
5. Is the pasture condition score ≥30 for the planned land units and are the planned practices expected to improve this score?
6. Will the applicant contract prescribed grazing (528) as part of the contract?

Progress Evaluation and Monitoring

Evaluation and monitoring of the TIP will take place on an annual basis. NRCS and partners will analyze interest levels, implementation rates, and staff availability to plan and direct workloads. Each contracted practice will be overseen by field office staff with certifications being made upon completion, contingent on practices meeting NRCS standards and specifications. Progress will be recorded in Conservation Desktop or other appropriate databases.

One of the primary outcomes for this TIP is to improve plant productivity and health, increase forage productivity and improve soil organic matter. Permanent monitoring sites will be selected for 10% of participating land units. NRCS staff and partners will monitor 10% of the pastures treated using the Montana Pasture Condition Scoresheet (MT-116A). The goal of this TIP is to improve the average Pasture Condition Score by 25% as compared to the baseline. It is anticipated that by investing in the infrastructure on the pastures producers will progressively adopt improved grazing management strategies. Improving grazing management will lead to increased forage production, healthier soils, lower risk of surface water contamination, and improved wildlife habitat. Livestock access to surface waters may also be reduced in some cases which could lead to improvements in water quality. Reduced need for synthetic fertilizers may also be realized on some pastures as a result of participation in this project.

References

Conant, R.T., K. Paustian, and ET. Elliott. 2001. Grassland management and conversion into grassland: effects on soil carbon. Ecological Applications 11:343-355

Franzluebbers, A.J., J.A. Stuedemann, H.H. Schomberg, and S.R. Wilkinson. 2000. Soil organic C and N pools under long-term pasture management in the southern Piedmont USA. Soil Biology & Biochemistry 32:469-478.