

# Cayuse Hills East Drought Resistance & Resilience Targeted Implementation Plan



USDA-NRCS  
Big Timber Field Office  
September 2020

**Cayuse Hills East**  
**Drought Resistance & Resilience**  
**Targeted Implementation Plan**  
**Sweet Grass County, Montana**

**Goal Statement:**

The goal of the Cayuse Hills East Targeted Implementation Plan (TIP) is to help landowners and operators in the eastern portion of the Cayuse Hills area develop drought-resistant livestock water and enhance forage resources to better withstand drought and help speed plant recovery.

**Overview/Background Information:**

The Cayuse Hills are uplands and foothills north of the Yellowstone River in Sweet Grass County, forming the broad divide between the Yellowstone and Musselshell drainages. The landscape is dominated by rangeland, with some introduced-species pastures also present. Due to the hydrology, geology, and terrain which define this area, numerous springs are present, which are heavily relied on as livestock and wildlife water sources. Flow rates vary, averaging 1-3 gallons per minute or less in normal years.

**Problem Statement:**

*Priority Resource Concern: Inadequate livestock water quantity, quality, and distribution*

*Associated Resource Concern: Plant productivity and health*

In recent years, weather patterns have become more extreme, including drought. Drought cycles will continue to occur, and it seems they may be more severe and/or sudden. It makes economic and natural resource sense for producers to prepare in advance for upcoming drought. Developing adequate, reliable livestock water sources and effective grazing plans and drought contingency plans are important for natural resource and animal health and the continued viability of ranching operations in the Cayuse Hills area.

In Sweet Grass County, inadequate livestock water is most common in the Cayuse Hills area north of the Yellowstone River. During periods of drought, the flows of the springs either decrease or dry up. Grazing rotations are seriously disrupted when available water is significantly diminished, forcing operators to leave pasture gates open so livestock can seek out enough water in multiple pastures. This in turn causes livestock to concentrate in pastures with water sources, which causes overgrazing and significantly impacts grazingland health and productivity, as well as riparian area condition. Many producers haul water daily to their livestock, often for weeks at a time, which is expensive, labor-intensive, and impractical to do for more than a few weeks. These conditions occurred during the

# Cayuse Hills East Drought Resistance & Resilience TIP

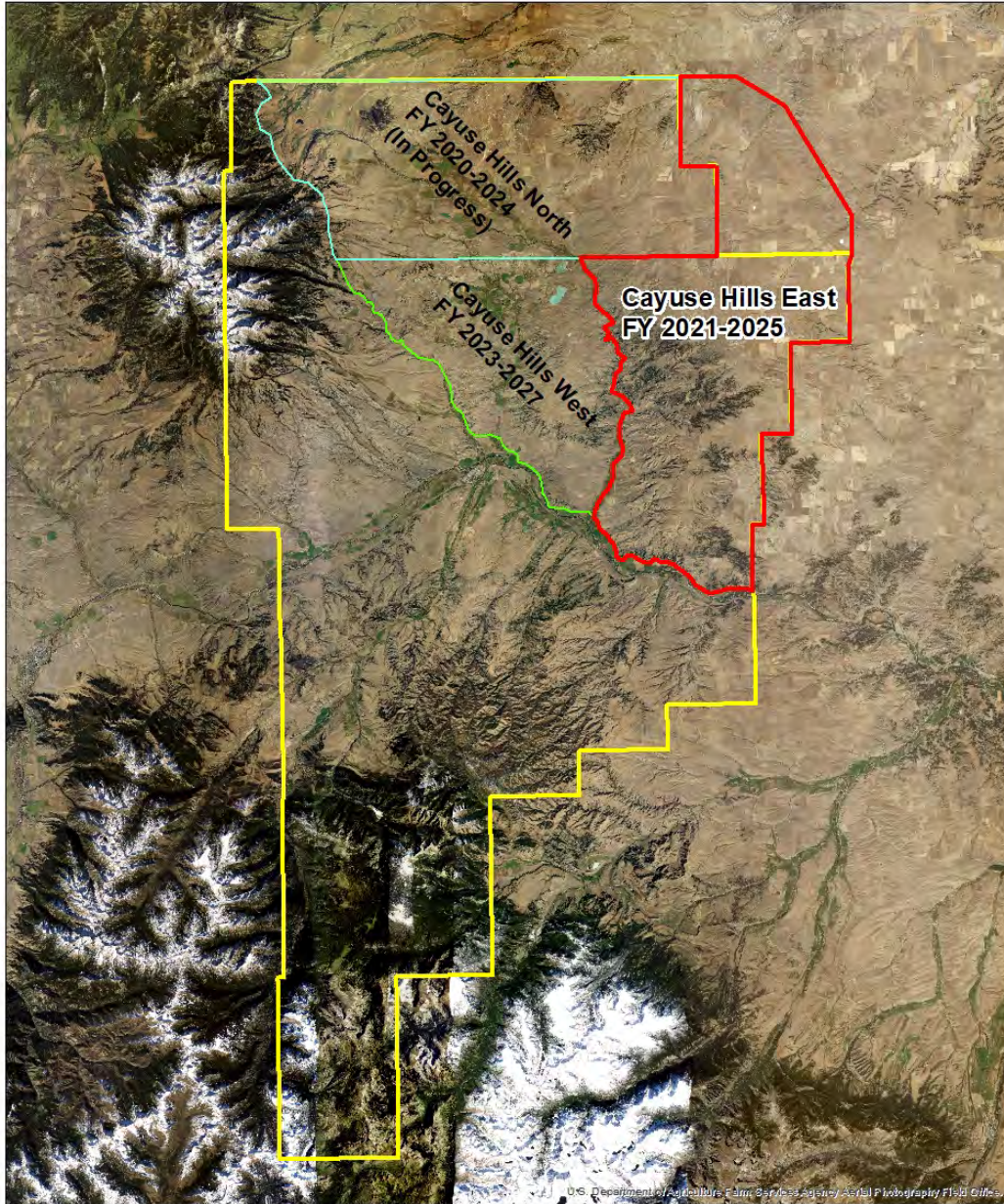
Date: 9/9/2020

District: SWEET GRASS CONSERVATION DISTRICT



Field Office: BIG TIMBER FIELD OFFICE

Agency: USDA - NRCS

Assisted By: Chuck Roloff



**Legend**

-  Cayuse Hills East
-  Sweet Grass County Boundary



Prepared with assistance from USDA-Natural Resources Conservation Service

**Figure 1. Cayuse Hills East Drought Resistance & Resilience TIP Area. (Cayuse Hills North is in progress and Cayuse Hills West will be covered by a future TIP proposal for FY 2023).**

1998-2006 drought, when livestock were often observed drinking muddy water out of their hoofprints to get water, which unfavorably impacted livestock health, stream condition, riparian areas, springs, and wetlands.

Springs have long been preferred as the primary livestock water sources in the Cayuse Hills. This is because they provide continuous gravity-flow water with no required energy or mechanical devices, such as pumps or generators, which can fail. The major problem is that many of the springs are undependable in dry years or even in the late summer or fall of average years when dry conditions occur.

Noxious weeds and invasive plants increase during drought periods. When it is dry, native forage grasses' root systems decrease, causing a corresponding decrease in above-ground biomass and an increase in the amount of bare ground available for colonization by noxious weeds and invasives. These effects can be evident for years after the end of a drought period. In the Cayuse Hills area, the manifestation of this has been dramatic increases in weedy annuals like cheatgrass, Japanese brome, and yellow alyssum, and the spread of noxious weeds like diffuse and spotted knapweeds.

Good grazing management before and during drought is crucial to mitigate negative effects of drought and speed recovery once it begins to wane (drought resilience). Decreasing bare ground by maximizing desirable plant population density and vigor is essential. In dry times, it is especially important to maximize forage recovery periods and keep the ground sheltered from sun and wind by leaving enough residual cover to conserve moisture and minimize soil surface temperatures. Adequate, reliable livestock water is the foundation for good grazing management.

This TIP has been developed to address natural resource concerns and priorities identified by landowners and other interested stakeholders through the Local Working Group (LWG) process. The LWG identified inadequate livestock water, riparian area health, and noxious/invasive plants as high priorities; these issues will be improved by implementation of this TIP. The long-range plan for Natural Resources Conservation Service (NRCS) in Sweet Grass County addresses these resource concerns and supports this TIP (see "Sweet Grass County Long-range Plan", sections II.E.3, page 12, and IV.C, page 27).

Since the Cayuse Hills covers over 500,000 acres, this area will be divided into three sub-areas that will be addressed by separate TIP proposals: Cayuse Hills North – 208,000 acres; Cayuse Hills West – 121,000 acres; and Cayuse Hills East – 229,000 acres. This TIP proposal covers only Cayuse Hills East, which includes roughly 40% of the Cayuse Hills area and has been selected as the second sub-area for potential TIP funding based on producer interest. Approximately 195,000 acres in the Cayuse Hills East area are rangeland and 23,000 acres are introduced-species pasture. Of those acres, it is estimated that 130,000 acres need treatment. To meet the objective, this TIP needs to treat approximately 104,000 acres. The Cayuse Hills North TIP had a successful start in FY2020 with five applications, demonstrating agricultural producer support and the need to address these targeted resource issues in the Cayuse Hills area.

## **Goals and Objectives:**

The following are desired future conditions in the Cayuse Hills treatment area:

- Adequate volume of reliable livestock water, even during drought
- Strategically-located watering facilities that enable adoption or enhancement of sound grazing systems, long-term
- Increased rangeland similarity indexes and health
- Improved introduced-species pasture health and production
- Improved riparian area condition
- Decreased extent and severity of invasive species and noxious weed infestations

None of the above goals can be achieved in a meaningful, lasting way without reliable livestock water and prescribed grazing.

The following outcomes that involve structural practices can reasonably be achieved over a 3-5 year period:

- Drill and conduct pumping tests on 10-20 new wells in the treatment area to provide reliable off-stream water
- Conduct pumping tests on 5-10 existing wells to determine potential for expansion of watering systems
- Install new livestock pipeline systems or expand existing systems to deliver water to approximately 25-35 watering facilities in strategic locations (water sources may include wells or perennial streams)
- Develop and implement prescribed grazing systems with 10-15 producers on 80-120,000 acres to get rangeland health in an upward trend in the short-term and significantly increase similarity indexes long-term; these systems will include drought contingency plans and rangeland health monitoring components
- Improve riparian area conditions to a “Sustainable” rating or the high end of “At Risk”, at minimum, through prescribed grazing systems and woody species regeneration

## **Alternatives:**

### 1) No Action

The “No Action” alternative would leave grazing operations in the Cayuse Hills area vulnerable to future droughts due to lack of reliable water sources, affecting their economic viability. Existing grazing practices would continue to be disrupted by drought or seasonal dry periods, causing further decline of rangeland health, riparian areas, and wildlife habitat. Areas with reliable water sources will continue to be heavily impacted by livestock concentration when other sources aren’t available. Marginal natural springs (seeps) will continue to be developed or re-developed as they have been for decades, but still won’t provide reliable water for livestock or wildlife in dry periods.

2) Develop Reliable Water Resources

Utilizing existing or new wells or pumping water from perennial streams and installing livestock water systems, without using Prescribed Grazing as the foundation for long-term positive changes in rangeland and riparian health, could cause resource damage, especially during drought.

3) Develop Reliable Water Sources and Use Prescribed Grazing to Build Drought-Resistance and Resiliency

Developing dependable livestock water by utilizing existing or new pumping-tested wells or pumping from perennial streams will provide water that can be counted on year in, year out for many years. Reliable water, together with Prescribed Grazing, can positively affect livestock distribution patterns, allow greater flexibility for grazingland management, increase plant diversity, and open many possibilities for maximizing vegetative recovery periods. It is very important to require good grazing management practices to complement water development. Without it, developing water can lead to overgrazing areas that weren't overgrazed before. Working with producers to develop a grazing system that meets their goals and the needs of their natural resources, based on sound range ecology principles, helps ensure that grazingland health will improve and that the improvements will be long-term. Together, these practices can build up drought-resistance and resilience and profoundly benefit the entire ecosystem.

**Proposed Solutions and Actions**

Alternative 3, "Develop Reliable Water Sources and Use Prescribed Grazing to Build Drought-Resistance and Resiliency", provides the most flexibility when working with different operations' resource needs and by far the best outcomes, considering landowner objectives, financial feasibility, and long-term adoption of practices.

NRCS Conservation Practices available through this TIP:

- (642) Water Well
- (533) Pumping Plant
- (516) Livestock Pipeline
- (614) Watering Facility
- (382) Fence
- (528) Prescribed Grazing

For a prescribed grazing plan to achieve optimum results and provide drought resiliency, several influencing factors must be evaluated: either stocking rates must be adjusted, or the grazing plan must be changed to accommodate the year's seasonal shortfalls and unanticipated disasters, while still preparing for the subsequent year.

The following measures will aid the decision-making process and contribute to short- and long-term success:

- Prescribed Grazing Plan: This is a grazing plan that meets the producer’s objectives and needs of the natural resources. Basic principles include:
  - Forage supply is in balance with the requirements of livestock and wildlife present
  - 45 days or less grazing period per grazing unit (“pasture”)
  - Periods of use (early, mid, late) on native rangeland are changed from one year to the next to aid plant recovery and reproductive success
  
- Monitoring: Placement of monitoring sites will be at locations that are the most vulnerable, or those places that show the greatest opportunity for recovery. Both photo monitoring and line transect data (cover) methods will be used. Photos will be taken each year and line transect data will be gathered at the beginning and end of the project. As photos are taken, the indicators of rangeland health described in “Interpreting Indicators of Rangeland Health” (T.R. 1734-6) will be used to evaluate the site stability, hydraulic function, and biotic integrity of the site. When used in conjunction with photos, this is a powerful tool to determine overall rangeland health, drive effective management decisions, and help determine if resiliency objectives are being met.
  
- Contingency Plan: A contingency plan will be developed with each ranch and adopted. NRCS staff will work with participants to help them see the importance of contingency plans, develop an action plan to follow, and identify their “trigger points” to begin implementing their plan. A contingency plan includes visual tools and cues, and NRCS will provide contingency plan worksheets and multiple reference live links (Climate Engine, Montana Drought Tool, and Ventusky), along with livestock and land evaluations to make effective management decisions.

### **Partnerships and Other Funding Sources**

- Sweet Grass Conservation District (SGCD) – local input, outreach; potential funding for outreach through Conservation District “HB 223” Grants
- Crazy Mountain Stockgrowers Association– local input, outreach
- Sweet Grass County/Montana State University (MSU) Extension – consultation, outreach, and education assistance
- Montana Department of Natural Resources & Conservation (DNRC) – Rangeland Resource Program; possible use of Range Improvement Loan Program (low-interest loans) by participants, education assistance.

### **Implementation**

- Project approval is being sought for 2021, but in order for planning to take place with applicants, no funds will be sought until 2022
- Signups will be held each year in 2021-2024 for FY2022-2025 contracts
- Initial applicant signup will be held in October 2021 (tentative)

- Planning will be done with eligible applicants as soon as possible after prioritization
- Contracts will be obligated as soon as possible after ranking and preapproval in FY 2022
- Implementation of individual contracts will take 3-5 years (all scheduled practices will be completed and certified within 5 years maximum)
- Years 1-3 of a contract will focus on installation of structural practices
- Prescribed Grazing may be contracted for up to 3 years, beginning in years 1-3 of the contract
- The amount of NRCS Staff assistance needed will depend on number of applications received, but will include two Big Timber Field Office staff (District Conservationist and Rangeland Management Specialist) and Bozeman Area Office staff (Rangeland Management Specialist, Biologist, and Engineering Technician)
- As with any project involving NRCS technical or financial assistance, National Environmental Policy Act (NEPA) concerns will be addressed through environmental evaluations that include cultural resources and threatened and endangered species reviews
- NRCS often assists producers with all aspects water developments from surface and groundwater sources, including adherence to Montana water rights regulations

**Table 1. Example of Expected EQIP Cost per Contract (based on FY2020 EQIP Payment Schedule)**

Practice Code	Practice	Scenario Name	Amount	Payment Rate	Total
642	Water Well	Typical Well, 100-600 ft. depth, 4" Casing	300 ft.	\$28.87	\$8,661
533	Pumping Plant	Well Pump Test	10 hours	\$151.63	\$1,516.30
533	Pumping Plant	Photovoltaic-Powered Pump, 251-400 ft. total head	1 ea.	\$2,352.02	\$2,352.02
516	Livestock Pipeline	Below Frost HDPE	1,500 ft.	\$1.58	\$2,370
516	Livestock Pipeline	Adverse Conditions	1,500 ft.	\$3.88	\$5,820
614	Watering Facility	Permanent Drinking with Storage, 1,000 to 5,000 gal.	3 ea. x 1,700 gal	\$1.37	\$6,987
614	Watering Facility	Storage Tank	10,000 gal.	\$0.59	\$5,900
382	Fence	Barbed/Smooth Wire	5280 ft.	\$1.93	\$10,190.40
528	Prescribed Grazing	Range, Standard, 1,501 to 10,000 acres*	8,500 ac. x 3 years	\$0.65	\$16,575
528	Prescribed Grazing	Pasture, Standard	945 ac.	\$4.98	\$4706.10
<b>Total</b>					<b>\$65,077.82</b>

(\* A separate (528) Prescribed Grazing scenario that targets Range and Pasture monitoring is being considered and may become available for use under this TIP beginning in FY2021).



**Table 2. Total Estimated Financial Assistance Needed by Year:**

<b>EQIP Funds</b>				
<b>Fiscal Year</b>	<b>Contracts (no.)</b>	<b>Acres Treated (total)</b>	<b>Average Expected Cost per Contract</b>	<b>Total</b>
2021	0	0	\$0	\$0
2022	2	18,890	\$65,077.82	\$130,155.64
2023	4	37,780	\$65,077.82	\$260,311.28
2024	3	28,440	\$65,077.82	\$195,233.46
2025	2	18,890	\$65,077.82	\$130,155.64
<b>Totals</b>	<b>11</b>	<b>104,000</b>		<b>\$715,856.02</b>

Outreach

- 1) Invite all producers in TIP area to an informational meeting sponsored by NRCS and SGCD and present TIP proposal information in January 2021 to further gauge interest
- 2) Promote TIP using the SGCD newsletter
- 3) Follow up with interested producers, provide application with specific deadline
- 4) Conduct field visits with interested applicants (after prioritization, but prior to ranking)

**Progress Evaluation and Assessment**

Field Office Applied and Reported Conservation Measures (6.90 Conservation Applied to Improve Environmental Quality)

- Progress acres will be reported for installed, field-certified practices
- Grazing records and evaluations will provide reportable Conservation Technical Assistance (CTA) progress on acres for contracts without (528) Prescribed Grazing contracted

Progress Evaluation by Field Office and Producer

- Photo monitoring records where 528 or other monitoring practices are contracted
- Evaluation of grazing plans and contingency plans on an annual basis
- Feedback from SGCD, Local Working Group, and participants

Outreach and Education

- Brief technical assistance (attendees at first outreach meeting)
- Informational meetings, technical and TIP outreach events (Big Timber)
- Focused event to help screen interested participants

### Monitoring

Monitoring of installed projects for effectiveness will be done on-site by Field Office staff with participants through annual contract reviews and by Area or State Office staff if selected for Quality Assurance Reviews.

### Ranking

1. Select one of the following:
  - Will Prescribed Grazing (528) be contracted on the entire operating unit?
  - Will Prescribed Grazing (528) be contracted only for a Conservation Management Unit (the acres grazed in a given year by the herd utilizing the contracted water developments)?
  - Will Prescribed Grazing (528) not be contracted?
2. Will Prescribed Grazing (528) be contracted for three years?
3. Will the proposed livestock Watering Facilities (614) be installed at least 1/4 mile from (or be fenced out from) riparian areas?
4. Will springs or existing spring developments be fenced out to protect them from livestock impacts?