

# Wisdom Reach Stock-Water Development

TARGETED IMPLEMENTATION PLAN

Natural Resources Conservation Service

Beaverhead County, Montana



## GOAL

The goal of this Targeted Implementation Plan (TIP) is to increase riparian health and instream flows in the Big Hole Valley.

## SUMMARY

This plan will be the second of three phases of offsite stock-water development performed in the Big Hole valley. A phased approach is being proposed due to funding allocations, landowner commitment and resource availability. This second TIP will treat the **primary resource concern of aquatic habitat for fish and other organisms** through developing watering systems fed by wells and spring developments. Reducing livestock utilization in riparian areas and diversion of water for livestock will improve habitat and instream flows in the Big Hole River and associated tributaries. The proposed stock water projects are an extension of stock water projects in the Upper Big Hole Offsite Water Development TIP for Arctic Grayling instream and riparian habitat.

Secondary resource concerns benefited by installation of the proposed projects include Soil - Bank erosion from streams, shorelines, or water conveyance channels; Water – Surface water depletion.

Arctic Grayling (*Thymallus arcticus*; henceforth grayling) are fish that are species of concern in Montana and continue to receive national concerns for conservation. Fluvial (river dwelling) Grayling are extirpated across the lower 48 states except for a small portion of the upper Missouri River basin in southwestern Montana. The Big Hole population is the most significant population remaining in the lower 48 states. It is so significant that landowners and partner agencies developed a Candidate Conservation Agreement with Assurances (CCAA) program to further protect the population as well as the landowners adjacent to the water courses.

One of the most limiting factors for this population of grayling is maintaining instream flows in the Big Hole River. Opportunities for enhancing instream flows and riparian conditions with participating landowners is a priority conservation measure for grayling in the CCAA. One opportunity mentioned specifically in the CCAA is the addition of offsite water systems.

Completion of the Wisdom Reach Stock-Water Development TIP requires a three-year allocation of \$122,500 per year for a total of \$367,500. Practices will be installed throughout the TIP area impacting many of the tributaries in the system and the Big Hole River. Contracts will be developed in FY 2023, 2024, and 2025. The continuation of conservation work that began in the Big Hole Valley in 1995 continues to be on the list of needs for Beaverhead County residents and landowners. Therefore, it has been added to the Beaverhead County Long Range Plan. This TIP ties directly to the revised Beaverhead County Long Range Plan (LRP) on pg. 16 and reflects recommendations of stakeholders around the county.

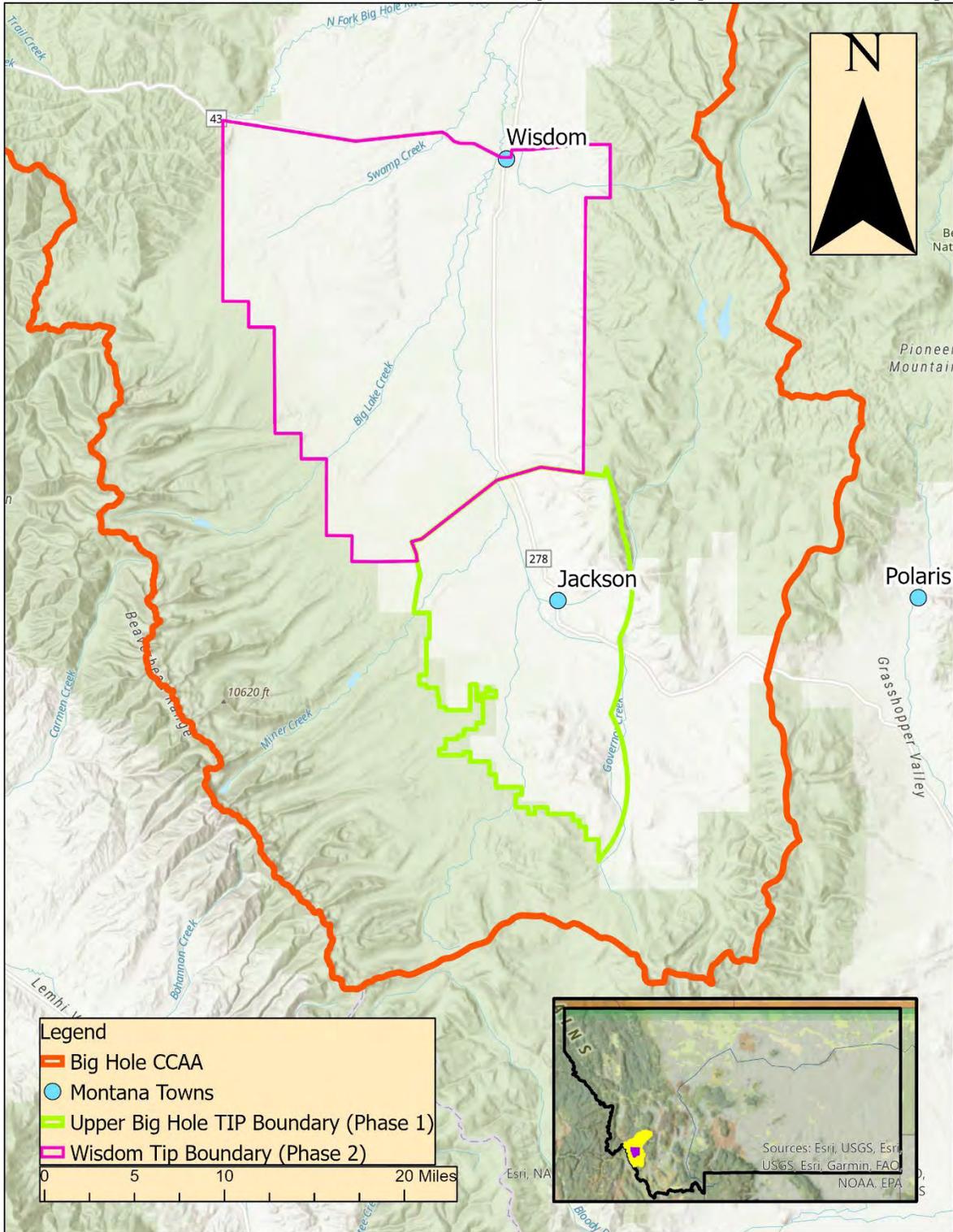
CCAA INTRO

The Big Hole Arctic Grayling Candidate Conservation Agreement with Assurances program (Big Hole CCAA) is a voluntary, non-federal land program that addresses grayling conservation threats to prevent a potential Endangered Species Act (ESA) listing in the Big Hole Valley. The Big Hole CCAA program was started in 2006. The agencies involved in the Big Hole CCAA program include Montana Fish, Wildlife & Parks (MTFWP; permit holder), Montana Department of Natural Resources and Conservation (DNRC), Natural Resource Conservation Service (NRCS), and the US Fish and Wildlife Service (USFWS). Currently, 33 private landowners with 150,782 acres of private and 6,230 acres of state trust land acres are enrolled in the Big Hole CCAA. Because of the conservation measures addressed in the Big Hole CCAA, the effective breeding population of grayling has increased 171% since 2011.

The CCAA has worked with landowners in a multi-faceted approach in their site-specific plans. First, they have removed direct threats by requiring permits for any structures or activities that could potentially physically injure grayling. Second, they improve stream flows by partnering with the landowners to measure and voluntarily contribute water to tributaries when appropriate. The CCAA also develops a grazing plan with the landowner for protection of riparian habitat. This includes pasture design, schedule, and fencing and is reassessed based upon data from monitoring. The grazing plan is based upon the forage inventory and riparian condition.

The improvement in the Big Hole Arctic Grayling population is attributed to greater habitat availability from the conservation efforts of enrolled landowners in the Big Hole CCAA. These habitat improvements and conservation partnerships are attributed as a primary reason for the rationale of a “not warranted” listing decision by the FWS under the ESA in July 2020. However, continued conservation measures, landowner partnerships, and habitat projects are necessary to further restore grayling in the Upper Big Hole and prevent a future ESA listing decision.

### Wisdom Reach TIP Stock-Water Development Map (Phase 1 Included)



Author: Payne; Sources: USDA NRCS, FWP, FWS, ESRI; Date 12/2021

## PROBLEM STATEMENT

This TIP proposes to install water systems to reduce livestock impacts in many of the riparian areas (e.g., bank trampling, sediment release, etc.), and should provide an improvement in future riparian assessment scores. The NRCS Riparian Assessment Method has been used to evaluate these stream reaches every 5 years. This assessment provides an indexed rating useful for establishing priorities in treating riparian/stream corridor problems and for stratifying stream reaches for further evaluation. Subsequent ratings over time on the same stream reach can be used to evaluate trend and provide an assessment of conservation practice or management effectiveness. Ten attributes are rated during the assessment to provide an overall score which is translated to a percentage of potential score for the site. These attributes include stream incisement (downcutting), lateral cutting, stream balance, deep binding root mass, riparian vegetative cover, noxious weeds, undesirable plants, woody species establishment, and riparian area/floodplain characteristics. After assessment a rating is calculated based on percentage of potential points. The highest rating is “Sustainable” with a score above 80% while any score between 50% and 80% will rate “At Risk” and anything under 50% receives a “Not Sustainable” rating. The desire is to see an increasing trend in stream reach rating over time with a goal of sustainable ratings for all reaches. Currently in the boundary of this TIP, there are nearly 35 miles of riparian corridor rated “At Risk”. All other reaches are “Sustainable”.

The CCAA actions mentioned above have measurably improved habitat, but landowners have limited grazing flexibility without addition of water systems. The water systems will remedy this by providing greater livestock distribution, for better utilization of available forage and by providing the ability to use pastures without riparian access. This will ultimately improve livestock grazing and riparian health. Lastly, these stock tanks will provide less reliance on drinking water from the Big Hole River and associated tributaries during winter when icing becomes a limiting factor for livestock water availability. These additional benefits along with improved instream flows will ultimately improve the ability for private landowner partnerships to improve habitat for grayling and livestock management.

A crucial conservation measure of the Big Hole CCAA is maintaining instream flows 75% of the time at or above instream flow triggers through May 1<sup>st</sup> – October 1<sup>st</sup> with average snowpack conditions. Flows are measured daily at trigger point locations on the main stem of the Big Hole River at the Wisdom Bridge (end of section C). Flow triggers for section the Wisdom Reach are 160 CFS in May and June, then drop to 60 CFS for July through the end of September. In 2021, flow triggers were met approximately 38% of the time for all the CCAA management sections, which is attributed to exceptional drought conditions. In general, Reaches A, B, and C of the CCAA often lack enough instream flows beginning July 1<sup>st</sup> due to below average snowpack conditions, overallocations of water rights, or early snow melt due to above average spring temperatures. By providing offsite water in these areas, the enrolled properties will divert less flows for livestock following irrigation in late summer. This will ultimately improve instream flows and percentage of days above the flow triggers for the surrounding tributaries and the Big Hole River.

## ALTERNATIVES

### 1. No Action –

Instream flows will continue to be diverted for stock water and livestock will be forced to access streams and ditches for water. This will continue decreased instream flow conditions, threatening fish survivability. No action will also result in continued tributary streambank and riparian vegetation degradation through livestock utilization and erosion.

### 2. **Off Site Water Development (Preferred Alternative) –**

Installation of watering facilities and supporting infrastructure such as wells, spring developments, pipelines, and pumps away from tributaries will allow livestock to access offsite water and enhance instream flows. In some locations, producers will be able to entirely shut off ditches solely used for livestock water. Another benefit of off-site water development is reducing or eliminating stream access by livestock by allowing grazing of pastures not containing riparian areas as well as livestock not being required to drink from surface water. Studies have shown that cattle prefer drinking from stock tanks over accessing water from creeks or streams. Riparian vegetation is sensitive to livestock impacts and degrades easily, compromising streambank stability and increasing erosion potential. The reduction of livestock pressure will allow vegetation to recover and restabilize banks, shade (cool) the water, and increase biodiversity of riparian habitat.

### 3. Off Site Water Development, Restoration of Rare and Declining Habitat, and Upland Wildlife Habitat Improvement-

Alternative 3 includes the benefits discussed in alternative 2, but additional practices are included such as riparian corridor improvements (e.g., Beaver Dam Analogs or BDAs and riparian vegetation plantings), and upland wildlife habitat improvements. Prescribed grazing is the application of grazing to enhance a specific habitat feature(s) through harvesting vegetation with appropriate timing, duration, and intensity. For example, controlled timing and intensity of grazing in riparian areas, that provides vegetation recovery, can allow for greater utilization of forage while enhancing riparian health. Upland wildlife habitat improvements such as BDAs or conifer thinning in strategic locations can increase mesic area abundance and riparian area footprints that not only benefits wildlife but improves aquatic habitat conditions (e.g., greater instream flows and cooler temperatures). All these practices together create multiple benefits that improve soils, enhance subsurface water storage, and release to streams, and expand mesic area footprints beyond streambanks that contributes to overall greater biodiversity and resiliency to the system.

## PREFERRED ALTERNATIVE

Alternative 2 is preferred by partners and landowners involved. While alternative 3 would provide greater desirable overall outcome, it is out of the scope of a TIP proposal and much more difficult to fully implement in the time frame allotted. Fencing off small riparian corridors is often not beneficial to resource concerns in the long run as the pastures become hard to graze properly. This leads to producers either not using the pasture at all and them becoming overgrown or removing the fences and

reverting to previous utilization. No new fencing needs were identified during the initial inventory due to pasture design and setup. In this case, livestock distribution can be managed more effectively with stock water development than fencing. Offsite water will improve instream flows and management flexibility, such that a vegetation response quickly shifts the riparian vegetation to improve bank stability and overstory shading. (Example photos below) Riparian assessment scores should increase in the five years following project implementation. Each landowner has worked with agency personnel to develop a Site-Specific Plan for their operation that addresses the grazing management on the enrolled acres to the level required to meet NRCS Prescribed Grazing Specifications. These grazing plans are periodically updated to reflect changes in management, infrastructure, livestock, and environmental conditions.



Example photo of vegetation response through reducing use by livestock.

PARTNER SUPPORT

Partnerships with private landowners and agencies are a critical role in the success of the Big Hole CCAA and are as strong as ever in the project area. Many partners including landowners, local conservation organizations, and several agencies have been working for roughly 30 years to conserve the Arctic Grayling and other species in the Big Hole Valley. Countless man hours and financial contributions have made the wins here a model for similar efforts in other areas. There is a feeling of combined success across all parties involved and it quickly became a team effort, and we are all willing to do what is necessary to continue the success.

This TIP proposal was brought forth by staff from MTFWP, NRCS, USFWS, and DNRC. The agency partnerships in the Big Hole CCAA have created the necessary groundwork to ensure success and gained landowner support to implement all projects proposed in this TIP. Partner funding will also be sought in the event other practices become necessary, such as fencing or vegetation establishment. Currently, we don't anticipate needing much vegetation establishment due to the abundance of native vegetation on site. The installation of any fence will be funded outside of this TIP, will be minimal and as absolute last resort to control cattle access when no other method achieves desired results.

Additional cost share of up to \$150,000 is anticipated to be provided through MTFWP or USFWS Partners Program to make the projects more affordable to the landowners. This cost share will be for materials and labor to reduce the cost incurred by landowners. The NRCS will be a major contributor through financial and technical assistance partnerships in this proposal.

FINANCIAL REQUEST BY PRACTICE

| Practice                       | Quantities | \$/Q          | Total     |
|--------------------------------|------------|---------------|-----------|
| 642 – Water Well (Ft)          | 3,150      | \$48.16-82.60 | \$162,036 |
| 574 - Spring Development (Ea.) | 5          | \$2,749       | \$13,745  |
| 533 - Pumping Plant (Ea.)      | 12         | \$1,808-5,687 | \$49,111  |
| 516 – Livestock Pipeline (Ft)  | 15,200     | \$2.15        | \$32,680  |
| 614 - Watering Facility (Gal)  | 32,300     | \$2.37        | \$76,551  |
| Total with 10% additional      |            |               | \$367,500 |

Unit costs found in Montana NRCS 2022 Payment Schedule

THE DILLON WORK UNIT

Currently, the Dillon work unit houses one Supervisory District Conservationist, one District Conservationist, two Soil Conservationists, one Civil Engineering Technician, and one Soil Conservation Technician. In addition, Partner agency personnel from USFWS and MTFWP are assisting with landowner outreach and will continue to assist through the practice implementation stage. Staff will have adequate time and skill sets to effectively implement this TIP.

Partners will also be contributing financially and with technical assistance to ensure the success of this TIP and further resource conservation. Individuals from partnering agencies are currently assisting with outreach. They will also be consulted when planning and implementing the practices to achieve the greatest results possible from each project.

### IMPLEMENTATION

Implementation of the Wisdom Reach Stock-Water Development would begin in fiscal year 2023. A total of 14 projects are ready for contracting within the proposal area with an additional 3 anticipated prior to application deadline. Completion of the Big Hole Water TIP requires a three-year allocation of \$122,500 each year beginning in FY2023. Contracts will be developed in FY 2023, 2024, and 2025 and project implementation is expected to occur in 2023, 2024, 2025, and 2026. The entirety of the project area is 119,255 acres.

### RANKING AND PRIORITIZATION

Ranking Questions:

1. Will practices be installed to benefit a land unit containing a stream reach currently rated as "At Risk" or "Not Sustainable" on its most recent evaluation using the NRCS Riparian Assessment method.
2. Does the application include water development utilizing conservation practice 642-Water Well?
3. Does the application include water development utilizing conservation practice 574-Spring Development?

### OUTCOMES

The instream flow increases seen after implementation of this TIP will benefit aquatic wildlife year-round but are vitally important in low runoff years that are becoming more common. These benefits come in a variety of ways that cumulatively play a big role to the stream inhabitants, especially Arctic Grayling. The cooler water temperatures that result from increased water depth and flow allow the stream to carry more oxygen to the organisms that need it to breathe. More water in the stream gives access to better hiding places and shaded cover by allowing fish to move up and down stream, as well as increasing agitation at the water surface which integrates more oxygen into the water. These changes result in a positive impact to the long-term health of the fish and other organism's dependent on these streams to complete their life cycle.

By increasing vegetation on and surrounding the stream banks as seen in the photo on page 7, we will decrease the amount of sediment lost from those banks to the water course. This sediment has many far-reaching effects such as clouding water impacting visibility of fish, coating aquatic vegetation limiting growth, reducing aquatic insect habitat, and raising water temperature thus reducing oxygen fish need

to breathe. Healthy riparian zones also act as filters trapping any excess nutrients and sediment from entering the water course during runoff events.

Through the reduction in bank loss and filtration of runoff the increase in riparian plants will provide clean clear cool water to the Big Hole River at the upper end of the headwaters of the Missouri River, North America's longest river. Many species of wildlife, livestock and people will benefit from the clean clear water as it provides better living conditions for plants and insects, the base species in the food chain, as well as the fish that inhabit those waters. With better living conditions comes more abundant and higher nutritional value of the food source which drives an increase in the animals they feed such as grayling, sandhill cranes, moose, and trout.

Riparian buffers have long been a focus of conservation efforts and recently have been discovered to sequester carbon and reduce climate change. Tree and shrub cover in riparian areas are effective for storing soil organic carbon (SOC) in the floodplain, upper-bank landforms, and the biomass of the trees themselves. (Matzek, 2020)

### PROGRESS EVALUATION

Instream flows will be evaluated annually, following implementation of each stock water system to gauge the improvement for instream flows collected in previous years. A vital component within a landowner's enrollment in the Big Hole CCAA is the requirement for allowing the agencies access to complete conservation monitoring for instream flow plans and riparian assessments on all mainstem reaches of the Big Hole River and its associated tributaries. Riparian assessments are completed every five years and follow the NRCS protocol. Stream flows are measured in numerous locations in all reaches every year by MTFWP and DNRC staff. The key location in this TIP area is on the main stem of the Big Hole River at the Wisdom Bridge (end of reach C). The Wisdom gauge is operated by the US Geological Survey and serves as the trigger point for flow management in Reach C in the CCAA. When low-flow trigger points are reached, enrolled landowners are contacted to activate their instream-flow site plan agreements. Flows returned to Big Hole tributaries or mainstem river by enrolled landowners are documented by the amount (cfs) of water contributed. These contributions are then reported to the CCAA agencies and amounts within the TIP boundary will be evaluated pre- and post-development of stock water developments to evaluate success. Periodic measurements are made in tributaries (Rock Creek, Swamp Creek and Big Lake Creek) to track conservation efforts and instream flow conditions. This level of monitoring data provides pre- and post-treatment contributions in this proposed TIP area.

Each of the riparian reaches that may improve from the implementation of practices through the TIP will be re-assessed within five years post project completion. The post treatment assessment scores will be compared to the most recent pre-treatment scores to gauge improvement. An improvement in riparian assessment score 5 years following TIP implementation of 5% is likely, based on results from previous projects. This 5% increase in score will improve many of the "At Risk" riparian habitat in the project area to "Sustainable".

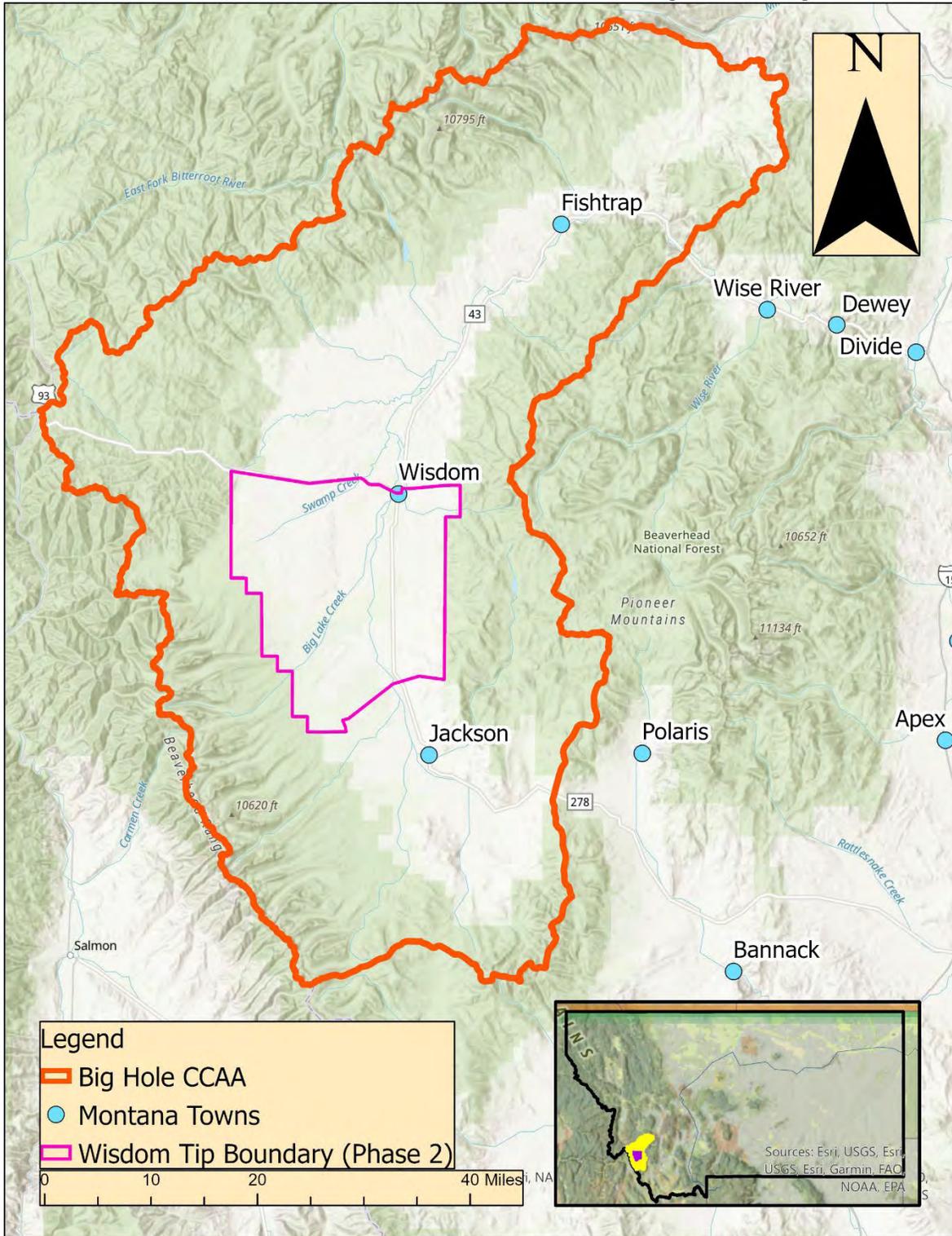
Assessments performed post treatment will be completed in the same manner as in the past with partners and NRCS staff. A report will then be generated and provided to the NRCS Assistant State Conservationist for Field Operations, partnering agencies, and landowners as requested.

REFERENCES

Matzek, Virginia, et al. "Increases in soil and woody biomass carbon stocks as a result of rangeland riparian restoration." *Carbon balance and management* 15.1 (2020): 1-15.

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### Wisdom Reach TIP Stock-Water Development Map



Author: Payne; Sources: USDA NRCS, FWP, FWS, ESRI; Date 12/2021