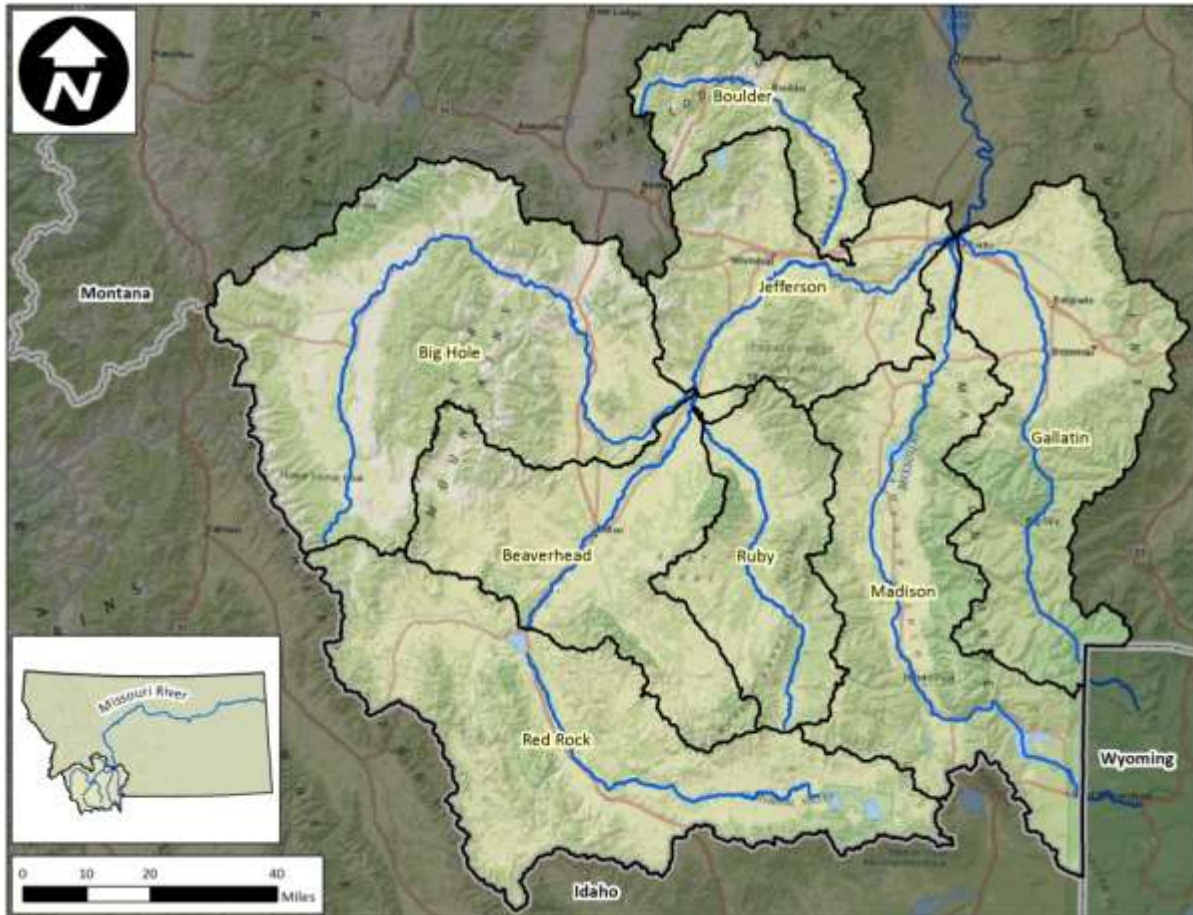


**A WORKPLAN FOR DROUGHT RESILIENCE
in the
MISSOURI HEADWATERS BASIN**

A National Demonstration Project



**Montana Drought Demonstration Partners
November, 2015**

EXECUTIVE SUMMARY

The urgency for drought resilience planning has never been greater. With rapid changes in land use and increasing impacts from climate change, communities need to determine ways to meet their drought planning goals. Montana is forging new ground to join agencies, resource managers and communities to plan for drought impacts and build drought resilience. The State of Montana and the National Drought Resilience Partnership (NDRP)--a collaborative of federal and state agencies, non-governmental organizations (NGOs), and watershed stakeholders--are working together to leverage and deliver technical, human and financial resources to help address drought in the arid West.

The Missouri Headwaters Basin in southwest Montana was selected as one of two national Drought Resilience pilots by the NDRP to demonstrate collaborative efforts to build resilience.. The Basin plays an important role in landscape connectivity in the northern Rockies, experiences frequent drought, and faces rapidly changing population and land use. Although local groups in the area recognize the need to prepare for drought, they lack the human and financial capacity to fully utilize planning tools and implement solutions. Federal and State resources can assist greatly with drought monitoring, forecasts, and early warning systems, but the information isn't always readily accessible to local planners and decision makers.

The goal of the Missouri Headwaters Drought Resilience Demonstration Project is a two-way proposition -- to deliver government drought mitigation tools and resources to watershed stakeholders who need them, and to build information from local groups in direct contact with the landscape. This project will produce a model for information sharing, efficient water use and storage, and community collaboration. It will also prepare people to mitigate for drought while preserving cultural and ecological values in the face of a drier future. In September 2015, Montana's NDRP members and local watershed representatives met in Dillon, Montana, in the heart of the Missouri Headwaters Basin, to identify shared goals for developing drought preparedness plans and mitigation strategies. From this meeting and two previous meetings, the group drafted a workplan that identifies objectives and implementation tasks required to assure drought resiliency basinwide. The workplan is organized in three overarching goals that are equally important to the success of the Missouri Headwaters Drought Resilience Demonstration Project:

- 1. Provide Tools for Drought Monitoring, Assessing and Forecasting**
- 2. Develop Local and Regional Capacity to Plan for Drought**
- 3. Implement Local Projects to Build Regional Drought Resilience**

Within each of these broad goals, the workplan highlights objectives and implementation tasks all of which will be refined as the project grows. The Montana NDRP is dedicated to empowering communities to prepare for and mitigate the impacts of drought on livelihoods and the economy. This workplan grew from participation of partners living and working in the Missouri Headwaters Basin, and defines a wide assortment of tasks that can be undertaken to reach the overarching goal of coordinated landscape-wide drought resilience.

KEY GOALS, OBJECTIVES, AND IMPLEMENTATION TASKS
GOAL 1: PROVIDE TOOLS FOR DROUGHT MONITORING, ASSESSING, AND FORECASTING
A. Develop a Drought Monitoring Network
<ul style="list-style-type: none"> • Coordinate a monitoring network to support local and regional needs • Expand soil moisture monitoring • Expand streamflow monitoring to address data gaps • Expand precipitation monitoring (CoCORaHS)
B. Develop a Portal to Share Monitoring, Assessment and Forecasting Information Across the Network
<ul style="list-style-type: none"> • Explore and compile existing data to create a central information portal on Basin specific data accessible to all water users
GOAL 2: DEVELOP LOCAL AND REGIONAL CAPACITY TO PLAN FOR DROUGHT
A. Build and Engage Local Capacity for Drought Planning
<ul style="list-style-type: none"> • Assure adequate staffing and operational needs • Provide consistent drought mitigation trainings and technical assistance
B. Increase Local Community Awareness of Drought and Supply Planning, Forecasting, and Mitigation
<ul style="list-style-type: none"> • Inventory and assemble local community member lists and conduct awareness workshops • Develop creative communication and outreach tools to engage local leaders in the planning process • Develop a marketing or branding strategy for drought and the demonstration project
C. Provide the Tools and Technical Assistance to Help Local Groups Strategize and Develop Drought Plans
<ul style="list-style-type: none"> • Monitor and identify risks, vulnerabilities and supply/demand triggers • Set systems in place to manage voluntary agreements
D. Connect Local Drought Plans at the Regional Scale
<ul style="list-style-type: none"> • Review local plans and merge into a regional drought preparedness plan for the entire Basin • Explore agency drought plans
E. Develop a Regional Network to create a Streamlined Structure to Share Learning, Coordinate and Pursue funding opportunities and Deliver Resources across the Basin
<ul style="list-style-type: none"> • Build a network/framework that unifies, coordinates and simplifies the delivery and sharing of resources.
GOAL 3: IMPLEMENT LOCAL PROJECTS TO BUILD REGIONAL DROUGHT RESILIENCE
A. Increase Water Conservation Measures
<ul style="list-style-type: none"> • Work with municipalities in the Basin to develop water conservation campaigns and measures • Work with the farmers/ranchers in the Basin to implement water conservation and irrigation efficiency and delivery measures.
B. Ensure Riparian, Floodplain and Water Management Measures Are in Place
<ul style="list-style-type: none"> • Inform the public of the value of riparian areas and floodplains for improved water holding capacities • Assess and improve natural storage capacity • Install off-stream stock water tanks to reduce impacts to riparian areas and facilitate upland grazing management • Consolidate and maintain points of diversion to improve efficiencies • Implement hybrid sprinkler/flood systems that transition as flows change
C. Ensure Upland Management Measures are in Place
<ul style="list-style-type: none"> • Demonstrate integrated management on public lands, and collaborate to implement projects to protect water quantity and quality in the headwaters • Develop a suite of soil and upland health demonstration projects in the Missouri Headwaters • Explore the impacts of conifer expansion on water yield • Study, understand, and implement practices that improve soil health and moisture holding capacities.

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WATERSHED	LOCALLY BASED GROUPS	GEOGRAPHY	NEEDS	ACTIVITIES & CHALLENGES	ECONOMY
Beaverhead and Red Rock Rivers	Beaverhead CD, Beaverhead WS Committee, Centennial Valley Association	Watershed Drainage: 3,620 Acre Feet of water produced (annually): 592,000	Funding for a BSWC member; Community engagement on drought; Develop drought plan; Better understanding of drought forecasting; Increased soil moisture and streamflow monitoring; Triggers for water conservation and to maintain instream flows; Management of wells for water quality; Plan for future supply and demand. Assess opportunities for natural storage.	Land use change and management; persistent drought over the past decade; insufficient overwinter releases for fisheries out of Clark Canyon dam; assessing relationship between soil health and drought resilience; protection of arctic grayling and sage grouse.	Mostly focused on agriculture and recreation interests. ~55% of the land area is federally or state owned. Beaverhead County is the #1 cattle producing and #3 sheep producing county in Montana. Primary crops: alfalfa, hay, potatoes, spring wheat. Angling and tourism are also vital to the local economy.
Ruby River	Ruby Valley Conservation District, Ruby Watershed Council, Gravelly Landscape Collaborative	Watershed Drainage: 965 sq. mi. Acre Feet of water produced (annually): 216,000	Funds to support capacity (e.g., attend meetings; trainings); Community engagement on drought; Better understanding of drought forecasting; Increased soil moisture, streamflow, snowpack and precipitation monitoring; Identification of instream flow triggers; Assessment of drought impacts.	Dewatering of tributaries, irrigation conveyance; competing needs between agriculture and fishing sectors. Previous droughts caused wildfire, reduced stream flows, and reduced water quality and soil health	Livestock production primarily on public land in the upper watershed for summer pasture; recreational fishing, with several fishing lodges and two fly rod manufacturers in Twin Bridges. Approximately 1200 residents.
Big Hole River	Big Hole Watershed Committee, Big Hole River Foundation, Beaverhead, Mile High & Ruby Valley CDs	Watershed Drainage: 2,500 sq. mi. Acre Feet of water produced (annually): 817,000	Funds to support capacity (e.g., attend meetings; trainings); Funding for a BSWC member; Better understanding of drought forecasting; Increased soil moisture monitoring; Identification of drought conservation measures (e.g., irrigation scheduling); Assessment of drought impacts.	In 1997 the BHC developed the Big Hole Drought Management Plan to mitigate the effects of low water quality for fisheries (particularly the Arctic grayling) through a voluntary effort among agricultural operations, municipalities, businesses	Cattle production; 70% public ownership and 30% private; fishing (blue ribbon trout stream). Fewer than 2,000 year-round residents

<p>Jefferson and Boulder Rivers</p>	<p>Jefferson River Watershed Council, Lower Jefferson Watershed Council, Jefferson & Ruby CDs</p>	<p>Watershed Drainage: 2,445 sq. mi. Acre Feet of water produced (annually): 120,000</p>	<p>Upper: Funds to support capacity (e.g., trainings; visit projects); Better understanding of drought planning tools and drought forecasting; Explore need for soil moisture monitoring; Improve ability to monitor, assess and document drought conditions; Increased snowpack and precipitation monitoring; Forest management for water supply. Lower: Training support; Community engagement on drought; work to preserve community priorities; educate community on the benefits of soil health; Develop drought plan; Increased soil moisture and precipitation monitoring; Improve ability to monitor, assess and document drought conditions.</p>	<p>Maintaining flow to support the ecosystem, and the fishery in particular; changes in land and water uses; aquatic invasive species; coordinating information among the tributaries</p>	<p>Agriculture and fishing. More than 57% of the land is private; the rest administered by USFS, BLM, and DNRC Trust lands</p>
<p>Madison River</p>	<p>Madison CD, Madison River Foundation, Madison Valley Ranchlands Group, Wildlife Conservation Society Community Partners Program</p>	<p>Watershed Drainage: 2,510 sq. mi Acre Feet of water produced (annually): 1,310,000</p>	<p>Funds to support capacity (e.g., attend meetings; trainings); Better understanding of drought planning tools and drought forecasting; Community engagement on drought; Develop drought plan; Increased soil moisture and precipitation monitoring; Identification of water conservation and instream flow triggers; Assessment of drought impacts; Management of wells for water quality. Plan for future supply/demand issues. Assess opportunities for natural storage.</p>	<p>Development; changing land and water use; chronic dewatering; nutrient overload; irrigation conveyance and infrastructure; ice jams; high percentage of absentee landowners</p>	<p>Agriculture; tourism, abundant wildlife and trout fishing.</p>
<p>Gallatin River</p>	<p>Upper: Gallatin River Task Force & Jack Creek Preserve Lower: Greater Gallatin WS Council, Gallatin Valley Land Trust, Association of Gallatin Irrigators, Gallatin CD, & City of Bozeman</p>	<p>1,800 sq. mi.</p>	<p>Upper: Develop drought plan; Better understanding of drought forecasting; Increased soil moisture and precipitation monitoring; Identification of instream flow triggers; Assessment of drought impacts; Fire preparedness. Lower: Funds to support capacity (e.g., attend meetings; trainings); Better understanding of drought forecasting; Increased soil moisture and precipitation monitoring; Identification of water conservation and instream flow triggers; Improve ability to monitor, assess and document drought conditions and assess impacts; forest management for water supply and improved fire preparedness. Assess opportunities for natural storage.</p>	<p>Upper Gallatin: Big Sky Resort Development, many absentee landowners Lower Gallatin: City of Bozeman is working on drought plan for its municipal water supply; the West Gallatin agricultural users have established a sub-watershed plan to ensure the West Gallatin is not dewatered.</p>	<p>Tourism, fly fishing destination (portions of the upper river have been designated as a blue ribbon trout streams); agriculture; unprecedented growth in Bozeman and the region</p>