

Colorado Watershed Restoration

Forested Headwaters: A Landscapes and Communities Assessment Fourmile Watershed Coalition

January 2021 Board Meeting

Program Application	
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	N Res
County/Counties: Bould	der <i>Me</i>
Drainage Basin: South Pla	tte hea

	DETAILS
	Total Project Cost: \$350,000
	Colorado Watershed \$175,000 Restoration Program Request:
	Recommended amount: \$28,500
	Other CWCB Funding: \$9,000 WSRF
	Other Funding Amount: \$166,000
	Applicant Match: \$0
	Project Type(s): Watershed Restoration
	Project Category(Categories): Watershed/Stream Restoration
_	Measurable Result: public workshops, defined scope, headwater streamflow monitoring, macroinvertebrate sampling, and a pilot project

Approximately 80 percent of Colorado's population relies on forested watersheds for municipal drinking water supplies. This project focuses on the landscapes and communities within the forested portions of the Boulder Creek watershed, including South, Middle, and North Boulder Creeks, which serve as primary drinking water sources for several municipalities. Following the structure recommended on the Colorado Stream Management Planning website in "A Framework for Integrated Water Management Planning (IWMP) in the Colorado River Basin," this project will involve: 1) stakeholder engagement; 2) defining purpose and scope; and 3) assessment.

Guiding principles, indicators and outcomes for meaningful public engagement will be created to increase the structure, effectiveness, and transparency of ongoing engagement activities. This process will include three facilitated public workshops that focus on forest restoration treatment types, including prescribed fire. Defining purpose and scope for this project will include collaboratively



defining broad landscape sustainability goals that support management across aquatic-riparian and forested ecosystems. Assessments will include headwater streamflow monitoring, macroinvertebrate sampling, montane meadow assessments, and a pilot project for comparative assessment of forest vegetation conditions using LIDAR.

Objectives include:

 Better engage public stakeholders, including historically underrepresented groups, on watershed related decisions and outcomes that impact their lives
 Ensure effective agency responses to the needs and priorities of communities. It is assumed that being

attentive to articulated priorities will be an increased support for watershed projects

- 3. Develop a more robust understanding of the current health and existing conditions of forested headwater areas
- 4. Better understand dynamic forest ecosystems under climate change and provide a strategy for climate-smart forest management designs
- 5. Increase the pace and scale of forest restoration and wildfire mitigation
- 6. Increase efficiency in forest vegetation conditions assessments to increase scale and capacity
- 7. Identify strategies to integrate forested headwaters into stream management planning



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Unfortunately, the available funding, the application score, and the need to reduce funding across all the major river basins represented in the applicant pool resulted in a reduced recommendation for this application. Staff recommends dedicating the reduced funding amount to Task 2: Defining Purpose and Scope. Staff is committed to working with the applicant on this task.



PROJECT SUMMARY SHEET		
Project Title	Forested Headwaters: A Landscapes and Communities Assessment	
Location	Boulder County: Boulder Creek watershed	
Grant Request	\$175,000	
Cash Match Funding	\$175,000	
In-Kind Match Funding	\$0	
Grant Type	CWCB Watershed Restoration Grant	
Name of Grantee(s)	Four Mile Fire Protection District (fiscal agent)	
Name of Applicant (if different than grantee)	Fourmile Watershed Coalition	
Mailing Address	1740 Fourmile Canyon Drive, Boulder CO 80302	
Position/Title	Maya MacHamer- Watershed Coordinator	
Email	fourmilewatershed@gmail.com	
Phone	303-817-2261	

Project Description:

Approximately 80 percent of Colorado's population relies on forested watersheds for municipal drinking water supplies. This project focuses on the landscapes and communities within the forested portions of the Boulder Creek watershed, including South, Middle, and North Boulder Creeks which serve as primary drinking water sources for several municipalities. Following the structure recommended on the Colorado Stream Management Planning website in <u>A Framework for Integrated Water Management</u> <u>Planning (IWMP) in the Colorado River Basin</u> (Lotic Hydrological, 2018), this project will involve: 1) stakeholder engagement; 2) defining purpose and scope, and 3) assessment.

Guiding principles, indicators and outcomes for meaningful public engagement will be created to increase the structure, effectiveness and transparency of ongoing engagement activities. This process will include three facilitated public workshops that focus on forest restoration treatment types including prescribed fire. Defining purpose and scope for this project will include collaboratively defining broad landscape sustainability goals that support management across aquatic-riparian and forested ecosystems. Assessments will include headwater streamflow monitoring, macroinvertebrate sampling, montane meadow assessments and a pilot project for a comparative assessment of forest conditions using lidar.



GRANT APPLICATION PROPOSAL

Qualifications Evaluation (Maximum of 20 points). Project sponsor and stakeholder involvement: The

Fourmile Watershed Coalition (FWC) is the lead project sponsor and will provide project and financial management, grant compliance and engagement and assessment labor. FWC will work with partners to support individual agency priorities while also creating a platform for the unification of priorities across agencies and ecosystems. Other partners include:

- University of Colorado Center for Sustainable Landscapes and Communities (CSLC)- CSLC will support the project through student involvement in developing indicators and outcomes for engagement effectiveness.
- City of Boulder-The City is beginning an update to their Source Water Protection Plan. FWC will participate in this process and work with staff to identify high priority headwater streams for BMI and flow assessment as well as an assessment of a forest restoration site.
- U.S. Forest Service- USFS has contributed 25K to support forest related outreach to increase social license needed for larger scale forest restoration projects including the Gold Hill pilot site area. FWC is also working with staff to identify and permit long-term streamflow monitoring sites on USFS lands.
- Pine Brook Water District: Pine Brook and partners are installing three stream gages with telemetry to monitor streamflows in streams and intermittent tributaries.
- Colorado State Forest Service: CSFS is a partner in outreach & engagement and increasing the efficacy of forest conditions assessments.

Amount	Match Type	Secured/P ending	Agency Partner	Description
\$25,000	Cash	Secured	US Forest Service	Forest related outreach.
\$10,000	Cash	Secured	Coalitions and Collaboratives (AIM)	Development of metrics to evaluate social values related to fire mitigation.
\$25,000	In-Kind	Secured	Department of Local Affairs	Use of terrestrial lidar to evaluate burn area slopes and to assess forest vegetation conditions.
\$26,000	Cash	Secured	Pine Brook Water District	Installation of stream gages and telemetry at three locations.
\$9,000	Cash	Secured	Water Supply Reserve Account	Flow measurement in conjunction with water quality sampling.
\$10,000	Cash	Pending	Boulder County Workforce	Paid summer intern for field work.
\$20,000	Cash	Pending	Great Outdoors Colorado	Grant application, "Balancing Conservation and Recreation in the

In-Kind and Cash Services:



				Boulder Creek Watershed." (due Feb, 2021)
\$50,000	Cash	Pending	FEMA/Boulder County match	FEMA Building Resilient Infrastructure and Communities (BRIC); Partnership and Capabilities grant. Due Nov 30, 2020.

<u>Organizational Capability (Maximum of 30 points):</u> *History of Accomplishments and Partners*: Since 2015, FWC has been awarded over 7 million dollars in state and federal grant funds for stream restoration, mine reclamation, forest restoration and education and outreach. All projects have been multi-objective and incorporated the priorities of multiple agencies and landowners. Examples include:

- 1. <u>Peak to Peak Water Quality Sampling-</u>FWC completed the first of two years of water quality sampling above and below five heavily used camping areas in and around the Peak to Peak Wilderness area. Sampling is being conducted to ascertain whether recreation is impacting ecoli levels in surface water. Water sample results are currently being analyzed.
- <u>Upper Ingram Gulch Restoration -</u> This project included 700 linear feet of restoration within an intermittent, burned upland gulch. Approximately 1400 CY of mine waste rock was removed from the drainage and stabilized in adjacent upland areas. Mine waste piles were capped and vegetated with native species. An immediate downstream reduction in arsenic levels were observed in surface water samples. The project occurred on both federal and private lands.
- 3. <u>Boulder County Forest Collaborative -</u> FWC has partnered with the Colorado State Forest Service to facilitate a county wide forest collaborative. This group of federal, state and local agencies is working to increase the pace and scale of forest restoration projects to decrease high intensity wildfire. The effort has been formalized in the attached MOU.

FWC has worked with numerous partners to plan and implement projects

- 1. **United States Forest Service:** The USFS is a primary partner in the Peak to Peak water quality sampling project, forest related outreach and engagement and planning for future forest restoration projects. FWC is working with the USFS to prioritize headwater streams for flow measurement and acquire permits for long-term monitoring sites.
- 1. **Colorado State Forest Service:** The State Forest Service a board member, primary partner in the Boulder County Forest Collaborative and active partner in forest restoration planning, community outreach and implementation.
- 2. **City of Boulder:** The City of Boulder is a board member and partner on the Peak to Peak water quality project as well as an active partner in planning for forest restoration and source water protection.
- 3. **CU Center for Sustainable Landscapes and Communities:** FWC sits on the Center's advisory board and regularly partners on ecosystem related community outreach and engagement.
- 4. **Colorado Geological Survey and School of Mines:** FWC partners with these agencies in the development and long-term monitoring of a debris flow early warning system that could eventually include a quick deploy system to monitor post-wildfire burn areas.
- 5. **Colorado Parks and Wildlife & Denver Water:** FWC is partnering with CPW and Denver Water to conduct wetland and riparian evaluations in an alpine meadow environment to evaluate the feasibility increasing biodiversity and the reintroduction of threatened species.



Level of Staffing: FWC currently has one full time and three part time staff members. By May 2021 FWC will have three full time and one part-time staff. FWC will hire summer intern for field data collection. The Community Engagement Planner, Forest Project Manager and Watershed Coordinator will coordinate all public engagement and project management. The Monitoring Program Manager will lead field assessments. It is estimated that this project, including current outreach and engagement efforts will require 50% of staff time. The allocation of this time will be manageable as four CDBG-DR flood recovery projects will be completed in spring 2021. A consulting team will be hired to facilitate engagement workshops, lead Task 2 and assist with prioritization of sites and lidar processing to evaluate forest conditions.

Budget: Task 1; Stakeholder Engagement- Based on a 0.5FTE Community Engagement Planner for two years (\$63,388); 3 workshops estimated at (\$15,000), Task 2 & 3; Defining Purpose & Scope and Assessment- \$130,000 for a consulting team and \$20,600 for direct costs including terrestrial lidar and BMI samples. \$20,000 for a field intern for two summers of data collection. The remaining \$71,012 includes costs for other staff to manage the project, collect manual forest conditions and flow data, as well as support ongoing outreach and engagement with communities.

<u>Schedule</u>: This project will begin in June 2021. A consulting team will be hired to for engagement and assessment assistance. It is assumed that that streamflow and meadow assessments will take two seasons to complete. Forest vegetation condition assessment will be completed in summer 2021.

Proposal Effectiveness (50 points)- Plan Discussion:

- Memorandum of Understanding for Collaboration and Coordination to Improve Forest Health and Reduce Wildfire Risk in Boulder County, Colorado (2020): The MOU was signed by 13 local, state and federal organizations. The MOU established a collective vision for resilient forested ecosystems which includes supporting water quality and quantity needs, habitat for robust and healthy flora and fauna and sustained recreational access. The MOU also calls for active management to enhance forest health and reduce wildfire risk which includes the use of the best available climate science that will help stakeholders understand how a changing climate will impact our forests (see highlighted attachment).
- 2. <u>City of Boulder Source Water Protection Plan (2017)</u>: The plan highlights potential climate change impacts to source water areas including increased wildland fire, ecosystem changes and decreasing water quantity due to snowpack changes. The plan specifies conducting site visits along Middle Boulder Creek and the 4th of July trail to evaluate riparian health and erosion. This area has multiple tributaries and meadows which would be evaluated in this project.
- 3. <u>Town of Nederland Source Water Protection Plan (2014)</u>: The plan calls for proactively evaluating actions that might mitigate and protect the source waters, downstream water quality concerns and management strategies that could be applied to minimize effects on water quality. The plan describes coordination and mutual participation in accomplishing shared Middle Boulder Creek watershed management project goals, such as fire mitigation, public outreach, water quality monitoring.



- 4. <u>Boulder County Environmental Sustainability Plan (2012)</u>: The plan calls for protecting, improving, and ensuring watershed health to secure an enduring supply of high-quality source water, while protecting the wildlife habitat, stream system functions, and aesthetics of the natural environment. Goals within the plan include maintaining healthy in-stream flows as part of riparian restoration efforts, planning and implementing landscape-scale forest treatments to maintain healthy forests, reducing wildland fire impacts to source waters and promoting broad access to public lands to develop a strong stewardship and conservation ethic.
- <u>Boulder County Community Wildfire Protection Plan (2011):</u> Goals within the plan include: 1) to reduce the number (prevention) and severity (mitigation) of future wildfires in Boulder County, 2) to unite all communities of Boulder County—residents of the mountains and the plains—in a collaborative effort to reduce the negative impacts of wildfire, 3) to help restore Boulder County forests to good health 4) engage residents and empower communities in wildfire mitigation and preparedness.

<u>Multiple Objectives</u>: This project intends to integrate multiple land and water management objectives that support holistic watershed health and ecosystem function. The project recognizes that successful watershed management hinges on the delicate and dynamic balance of human and natural systems.

- 1. Better engage the public stakeholder, including historically underrepresented groups, on watershed related decisions and outcomes that impact their lives.
- 2. Ensure effective agency responses to the needs and priorities of communities. It is assumed that being attentive to articulated priorities will increase support for watershed and forest restoration projects.
- 1. Develop a robust understanding of the current health and existing conditions of forested headwater areas.
- 2. Better understand dynamic forest ecosystems under climate change and provide a strategy for climate-smart forest management designs
- 3. Increase the pace and scale of forest restoration and wildfire mitigation.
- 4. Increase efficiency in forest vegetation conditions assessments to increase scale and capacity.
- 5. Identify strategies to integrate forested headwaters into stream management planning.

Ongoing projects that intersect with this project include:

- 1. Left Hand Watershed Center's Adaptive Management at Scale: data collected can be integrated into the Adaptive Management project.
- 2. Boulder County's Watershed Action Plan. Data can inform prioritization of sub-watersheds that are vulnerable to climate change.
- 3. Boulder County Forest Collaborative and St Vrain Forest Health Partnership's ongoing outreach, evaluation and prioritization of forest restoration sites.
- 4. Support of the thirteen signatories to the Boulder County MOU (attached) which states a collaborative vision for improved forest health and decreased wildfire risk.

<u>Monitoring Plan</u>: This project is primarily a planning and assessment project. However, a long-term monitoring plan with rating curves will be developed to encourage streamflow monitoring at identified stream/tributary locations.



GRANTEE and FISCAL AGENT (if different): Grantee: Fourmile Watershed Coalition. Fiscal Agent: Four Mile Fire Protection District

PRIMARY CONTACT: Maya MacHamer, Watershed Coordinator

ADDRESS: 1740 Fourmile Canyon Drive, Boulder CO 80302

PHONE: 303-449-3333 (office), 303-817-2261 (cell)

PROJECT NAME: Landscape and Community Assessments of the Forested Headwaters of Boulder Creek

GRANT AMOUNT: \$175,000

INTRODUCTION AND BACKGROUND:

Approximately 80 percent of Colorado's population relies on forested watersheds for municipal drinking water supplies. This project focuses on the landscapes and communities within the forested portions of the Boulder Creek watershed, including South, Middle, and North Boulder Creeks which serve as primary drinking water sources for several municipalities. Following the structure recommended on the Colorado Stream Management Planning website in <u>A Framework for Integrated Water Management</u> <u>Planning (IWMP) in the Colorado River Basin</u> (Lotic Hydrological, 2018), this project will involve: 1) stakeholder engagement; 2) defining purpose and scope and 3) assessment.

Guiding principles, indicators and outcomes for meaningful public engagement will be created to increase the structure, effectiveness and transparency of ongoing engagement activities. This process will include three facilitated public workshops that focus on forest restoration treatment types including prescribed fire. Defining purpose and scope for this project will include collaboratively defining broad landscape sustainability goals that support management across aquatic-riparian and forested ecosystems. Assessments will include headwater streamflow monitoring, macroinvertebrate sampling, montane meadow assessments and a pilot project for a comparative assessment of forest vegetation conditions using lidar.

OBJECTIVES:

- 3. Better engage the public stakeholder, including historically underrepresented groups, on watershed related decisions and outcomes that impact their lives.
- 4. Ensure effective agency responses to the needs and priorities of communities. It is assumed that being attentive to articulated priorities will be an increase support for watershed projects.
- 6. Develop a more robust understanding of the current health and existing conditions of forested headwater areas.
- 7. Better understand dynamic forest ecosystems under climate change and provide a strategy for climate-smart forest management designs
- 8. Increase the pace and scale of forest restoration and wildfire mitigation.
- 9. Increase efficiency in forest vegetation conditions assessments to increase scale and capacity.
- 10. Identify strategies to integrate forested headwaters into stream management planning.



TASKS:

TASK 1: Stakeholder Engagement.

<u>Description of Task</u>: The general public is a critical and complex stakeholder and public knowledge, support and participation are important aspects of watershed management. Fortunately, a broad spectrum of agency stakeholders have been engaged through numerous ongoing planning processes. The current stakeholder engagement gap is in enhanced, sustained and productive engagement of the public. Agencies must move beyond the concept of crafting a better message for public consumption and toward a vision of partnership with a spectrum of public stakeholders.

This task will build upon the current outreach work of the coalition by developing a set of guiding principles, indicators and outcomes to measure the *effectiveness* of engagement. While significant outreach has occurred with agencies and ongoing public engagement is occurring, this task will formalize goals and methods in a manner that will allow transferability to other agencies should they wish to integrate engagement methods into their own outreach. This task will also create a foundation for future stream management planning.

Method/Procedure:

- 1. Collaboratively develop a set of guiding principles for public engagement.
- 2. Develop indicators and outcomes to measure the effectiveness of engagement.
- 3. Acquire accurate data on community needs and priorities through three public workshops.
- 4. Identify effective engagement methods which include integrating public feedback.

<u>Deliverable</u>: Matrix of public engagement principles, indicators, outcomes and engagement methods.

TASK 2: Define Purpose and Scope

<u>Description of Task:</u> Forested headwaters are ideal places to evaluate the intersection of aquaticriparian ecosystems and upslope management. Better understanding existing conditions and the nexus of these ecosystems will aid in tracking the effects of climate change in these critical ecosystems. Within the headwaters of Boulder Creek, the Niwot Ridge Long-Term Environmental Research Center research has shown that these headwaters along with other alpine systems are already seeing ecosystem changes due to climate change and warming temperatures.

Within forested headwater regions it is impossible to extract stream characteristics from an evaluation of the holistic system of intermittent and ephemeral tributaries, meadow systems and forested uplands. As such, this task will help define feasible methods to conceptualize, assess and integrate the existing conditions of various ecological systems and potential management needs into broader landscape sustainability goals. This task will create a foundation for the integration of project outcomes into future watershed or stream management planning.



Alpine areas are often not prioritized for forest restoration treatment because the fire return interval has historically been hundreds of years. 2020 has demonstrated the effects of climate change, the rates of snowpacks melting earlier in the season, drought conditions impacting high elevation fuel moistures and large-scale wildfire that have significant post-fire erosion impacts on drinking water sources. It is imperative that forested headwaters are better understood, better protected and agencies and sectors better coordinate in co-developing management priorities and restoration treatments that are multi-objective.

Method/Procedure:

- 1. Hire a consultant.
- 2. Define broad landscape sustainability goals that integrate aquatic-riparian and upland ecosystems.
- 3. Define/recommend climate-smart forest management designs.
- 4. Develop a montane meadow prioritization strategy.
- 5. Evaluate the American Rivers Meadow Score Card and revise as necessary for the Boulder Creek watershed.
- 6. Develop a strategy for integrating forested headwaters into stream management planning.

<u>Deliverable</u>: Report detailing the findings listed above.

TASK 3: Assessment

Description of Tasks:

Sub-task 3.1: Prioritization and assessment of montane meadows.

This task is modeled after the program conducted by the <u>Sierra Meadow Partnership</u> in Northern California. This task will strategically prioritize and assess montane meadows for future restoration to improve a variety of ecosystem functions including ground water storage and carbon sequestration. Assessment will follow protocols set forth by American Rivers with the <u>Meadow Condition Scorecard</u>. This process will create a foundation for future meadow restoration that could be integrated into forest restoration projects to remove conifer encroachment.

Sub-task 3.3: Comparison of forest conditions assessment using lidar.

One of the major gaps in increasing the pace and scale of forest thinning and prescribed burning projects is agency capacity. This hurdle exists at the local, state and federal levels. This task will evaluate the efficacy of multiple types of forest vegetation conditions assessment to determine the feasibility of ground or aerial lidar use to increase the scale of preliminary conditions assessment. Using lidar may minimize the amount of time agencies need to be on the ground, manually assessing forest conditions. This could help move larger acreage projects through regulatory processes (NEPA), provide data for more robust grant applications and, ideally, provide enough information to develop preliminary treatment prescriptions for implementation.



The Gold Hill project area will be used as pilot site (see attached map). The site includes 828 acres of private and USFS lands currently being evaluated for project implementation. This site also uses Potential Operational Delineations (PODS) as a planning guideline that also supports wildfire suppression tactics (see attachment). A consultant will be hired to process existing aerial lidar (post 2013), acquire and process terrestrial lidar at pilot sites and compare with manual data collection.

Sub-task 3.3: Streamflow measurement.

This task will acquire streamflow measurements in multiple headwater tributaries where no baseline data exists. Gages with telemetry will be installed in three lower tributaries while rating curves will be developed in higher, smaller tributaries where staff gages can be installed. This effort will occur in conjunction with existing water quality sampling sites

Sub-task 3.4: Benthic Macroinvertebrate sampling.

In conjunction with streamflow measurement and meadow assessments, BMI sampling will assist in developing a more robust understanding of the current health of forested headwaters and set the stage for long-term monitoring.

Method/Procedure:

- 1. Hire a consultant for lidar processing and meadow assessment
- 2. Prioritize sites for assessment
- 3. Assess selected areas (streams, meadows and forests)
- 4. Reporting

Deliverable: Report that captures site location, methods and results.

TASK 4: Grant Administration

<u>Description of Task</u>: Prepare all required financial and reporting documents to assure grant compliance.

Method/Procedure:

- 1. Review grant requirements,
- 2. Track financial expenditures and budgets,
- 3. Compile accurate reimbursement requests,
- 4. Prepare deliverables and reports,
- 5. Project close out.

<u>Deliverable</u>: Accurate and timely requests for reimbursement and reports.



- 1. Budget (pdf)
- 2. Match committments
- 3. Letters of Support:
 - City of Boulder Utilities
 - USFS, Boulder Ranger District
 - Colorado State Forest Service
 - Boulder County Firefighters Association
- 4. Map of Gold Hill project site to be used for competitive lidar/forest vegetation conditions assessment.
- 5. Description of PODs (Potential Operational Delineations). Boulder County does have specific PODs across the landscape. The Gold Hill POD is outlined in blue on the map.
- 6. Boulder County Memorandum of Understanding outlining a shared vision of forest health and wildfire risk reduction. Pertinent sections are highlighted.
- 7. American Rivers Meadow Scorecard.

I .		Budg	get and Sche	dule				
Date: 11	Date: 11/5/2020							
Name of	f Applicant: Fourmile Watershed	I Coalition						
Name of	f Project: Forested Headwaters:	: A Landscapes an	d Communitie	es Assessr	nent in the B	oulder Cree	k Watershee	d
Task No.	Task Description	Start Date	End Date	CWCB Funds	Other Funding *cash	Other Funding *in-kind	Match source	Total
1	Public Outreach	6/1/2021	12/1/2022	\$42,500	\$60,000		USFS, FEMA/BOC	\$102,500
2	Defining Purpose and Scope	8/1/2021	12/1/2022	\$22,500	\$22,500		ĈOCO	\$45,000
3	Assessment	8/1/2021	12/1/2022	\$94,543	\$77,043		DOLA, Pine Brook, Other Grants	\$171,586
4	Grant Management (12%)			\$15,457	\$15,457			\$30,914
5								\$0
6								\$0
7								\$0
8								\$0
TOTAL				\$175,000	\$175,000	\$0		\$350,000

Project Match Commitments:

- 1. FWC is in the process of contracting with the Coalition for the Poudre River Watershed for \$25,000 from the USFS for forest related outreach.
- 2. FWC was awarded grant funds from Coalitions and Collaboratives for multiple tasks including developing social metrics to measure engagement related to wildfire mitigation. Funds allocated for this task are \$10,000.
- 3. FWC is using a portion of CDBG-DR funds to rent terrestrial lidar equipment to evaluate burned slopes in the Fourmile watershed. This equipment will also be used to evaluate the Gold Hill pilot project site in Gold Hill (within the Fourmile watershed). Estimated cost is \$25,000.
- 4. The Pine Brook Water District has allocated \$46,000 for the installation of stream monitoring sensors, telemetry and other flow equipment on their reservoir. \$21,000 of this is directly allocated to streamflow measurement in tributaries. An additional 5K was donated to the coalition to support the project.
- 5. Water Supply Reserve Funds have been awarded for water quality monitoring at headwater locations. 9K will be allocated to sampling and streamflow monitoring in 2021.
- 6. Boulder County Workforce has provided funding for six interns who have worked with FWC over the past year. The estimated funding amount allocated per intern is 10K. However, funding availability is dependent upon Workforce grants and a full commitment cannot be made until closer to the summer season.
- 7. FWC and other partners will be submitting an application for grant funds through Great Outdoors Colorado. A portion of the grant funds will be sued for streamflow monitoring at additional water quality monitoring sites. These sites will be determined in relation to increased recreational usage in the headwaters as a result of Covid 19.
- Boulder County has committed to a 25% grant match of up to 100K for the FEMA Building Resilient Infrastructure and Communities grant. These funds will be shared with the Left Hand Watershed Center. 50% of the estimated grant award was included as match for this project (50K).



November 2, 2020

Chris Sturm Colorado Water Conservation Board 1313 Sherman Street, Room 718 Denver, CO 80203

Dear Mr. Sturm,

The City of Boulder's (city) Utilities Department supports the Fourmile Watershed Coalition's grant application for a Landscape and Community Assessment of Forested Headwaters of Boulder Creek. These headwaters provide critical drinking water sources for several communities, including the City of Boulder, and also provide habitat for diverse wildlife and plant species, and large areas of conifer forests. These forested headwaters are at risk for wildfire due to increased recreation in the area, climate change leading to warmer and drier conditions, and beetle kill.

The city supports Fourmile Watershed Coalition's proposed project, which will include public engagement; defining landscape sustainability goals to set the foundation for future stream and watershed management planning; and assessing stream flows and biological communities in streams where there is limited to no data currently available. The city is collaborating with the Fourmile Watershed Coalition on a variety of water quality and forest projects and looks forward to expanding mutually beneficial work proposed in this application.

Fourmile Watershed Coalition has proved many times over their ability to engage the public, and plan and successfully implement projects to protect water quality and riparian habitat. The city has been fortunate to work with the Coalition on a variety of projects and hopes to continue this collaborative effort on the Landscape and Community Assessment project.

Sincerely,

Kate Dunlap

Kate Dunlap <u>dunlapk@bouldercolorado.gov</u> Source Water Quality Program Manager City of Boulder



2140 Yarmouth Avenue Boulder, CO 80301 303-541-2500 Fax: 303-541-2515

 File Code:
 2300

 Date:
 November 2, 2020

Chris Sturm Colorado Water Conservation Board 1313 Sherman Street Denver, CO 80203

Dear Mr. Sturm,

I am writing in support of the Fourmile Watershed Coalition request for funding of an outreach and assessment project in the upper Boulder Creek Watershed.

The Boulder Ranger District has worked with the Fourmile Watershed Coalition on water quality sampling near campsites and with the Boulder County Forest Collaborative, an effort to convene a group of diverse stakeholders to work through ways to increase the scale and scope of forest health projects. The Coalition's focus of an all lands approach to forest health and landscape resiliency as well as their connection to the mountain communities within Boulder County are the perfect catalyst for us to implement mutual goals.

This proposal compliments both of the efforts mentioned above by more thoroughly evaluating water resources in the upper tributaries, evaluating forest conditions assessment methodologies and adding robust public outreach and engagement to increase the pace and support for forest treatments including prescribed burning. The award of this grant will allow for assessments at strategic locations to help inform specialists on ecosystem restoration needs that will contribute valuable information to long term management plans.

The Fourmile Watershed Coalition's project intends to assess impacts within the forested watershed by gaining a more in depth understanding of existing land and water conditions. Acquiring water quality and forest data will help to understand the ongoing impacts of climate change and water quality and quantity in the forested Front Range of the Boulder Ranger District. The district is supportive of the Coalition's project and encourages the selection committee to consider this funding request.

Thank you for supporting the Boulder Ranger District and our partners. If you have any questions, please feel free to contact me at 303-541-2505, or E-Mail: <u>angela.gee@usda.gov</u>.

Sincerely,

GELA GEE

ÁNGELA GEE DISTRICT RANGER





COLORADO STATE UNIVERSITY

Boulder Field Office 5625 Ute Highway Longmont, CO 80503 303-823-5774

November 4, 2020

Chris Sturm Colorado Water Conservation Board 1313 Sherman Street, Room 718 Denver, CO 80203

Dear Mr. Sturm,

The Colorado State Forest Service, Boulder Field Office, would like to express support for the Fourmile Watershed Coalition's grant application for a Landscape and Community Assessment of Forested Headwaters in the Boulder Creek watershed. The headwaters of Boulder Creek include many remote areas with diverse wildlife and plant species, rich riparian areas large areas of conifer forests. These same areas are at high risk of wildfire and other effects of climate change including drought, decreases in water supply and species loss. The proposed project includes:

- Planning and community workshops to improve and measure public engagement in order to broaden support for wildfire risk reduction, forest restoration and other ecosystem restoration projects while ensuring that community priorities are effectively integrated into planning processes;
- Defining landscape sustainability goals that support the intersection of aquatic-riparian and upland forest ecosystems while setting the foundation for future stream or watershed management planning; and
- Assessments which include stream flow measurement in headwater tributaries, macroinvertebrate sampling, mountain meadow and forest conditions assessments.

These activities address identified gaps in data and outreach and work to support holistic and sustainable management within the landscapes and communities of the forested headwater region.

The Colorado State Forest Service's mission is to achieve stewardship of Colorado's diverse forest environments for the benefit of present and future generations. We value collaborative processes and appreciate the benefits of evaluating wildfire risk, watershed health and resiliency, and project development on a watershed scale. A coordinated effort to strategically plan landscape scale fire mitigation and forest restoration projects will be an asset to our watersheds and communities.

The Colorado State Forest Service, Boulder Field Office, looks forward to collaborating with the Fourmile Watershed Coalition to increase the pace and scale of forest restoration and keep up with the rising complexity of the wildland fire situation in the West.

Sincerely,

Ben Pfohl Supervisory Forester



November 5, 2020

RE: Letter of Support for Fourmile Watershed Coalition Forested Headwaters Assessment grant application.

To Grant Reviewer:

The Boulder County Fire Fighters Association (BCFFA) supports the efforts of the Fourmile Watershed Coalition seeking funding for community outreach and watershed assessments within the Boulder Creek watershed.

The Watershed Coalition has been instrumental in the development and ongoing facilitation of the Boulder County Forest Collaborative. The collaboration and planning that has grown from this effort will benefit from a comparative evaluation of forest vegetation assessments including lidar. Gold Hill is an ideal location for a pilot project as large scale restoration will begin in 2021 and the community has been effected by recent wildfires. The BCFFA supports this project as a demonstration of how multi-objective, multi-agency partnerships can become the norm for ongoing wildfire mitigation and forest restoration projects throughout the county.

The BCFFA represent a collaboration of mountain fire chiefs from western Boulder County and the Boulder County Cooperators, the training arm of the organization. Together we have a joint mission to provide safe and effective all-hazard training and a forum for the open discussion of emergency response. As such, wildfire risk reduction and forest health and resiliency are extremely important to our organization.

The BCFFA fully supports these efforts to focus time and energy on forest and watershed health, education and wildfire risk reduction planning. Please strongly consider this funding request as it would greatly benefit our communities.

Sincerely,

Bret Gibson

Bret Gibson President



Boulder County Fire Fighters Association 501(c)(3) Non-Profit EIN 84-1287461



A crash course in PODs

Enhancing preparedness, communication, and responder safety

What are PODs?

Think: container, or operationally relevant fire management unit

Potential wildland fire operations delineations (PODs) are polygons whose boundary features are relevant to fire control operations (e.g., roads, ridgetops, and water bodies). PODs are useful for summarizing wildfire risk and planning strategic response to unplanned ignitions accordingly. In an operational response context, POD boundaries can be used to guide choices of where to construct or hold fire line as well as where to conduct burnout operations. PODs may also prove useful for strategic fuels planning, with potential applications for designing controlled burn units, reinforcing existing POD boundaries, or prioritizing treatment opportunities within PODs. By vetting and mapping POD boundaries, we are essentially formalizing and institutionalizing the knowledge of fire management experts.

Why use them?

A basic principle of risk management is to get ahead of problems one may face down the road. Doing so can help reduce time pressure, reduce uncertainty, and expand options – ultimately facilitating safer and more effective response. The Red Book embraces this idea, describing pre-season preparedness work as a key element of risk management that is critical to success when a fire starts. Pre-fire planning can provide a valuable means for building capacity within the organization, communicating hazards and opportunities with key stakeholders and partners, and sharing risks and responsibilities. The Red Book and the Forest Service Wildland Fire Risk Management Protocols both call for managers to collaboratively "predetermine" response strategies that balance protection of values at risk with firefighter and public exposure. Developing PODs, we think, is a good first step to meeting the intent of these requirements. Pre-fire planning with PODs is intended to provide actionable information and to expand flexibility, and not to make decisions.

How are PODs created?

The basic ingredients are local expertise, maps, GIS, and getting out in the field to ground truth. No amount of shiny analytics can or should tell a manager where to locate a POD boundary. That said, RMRS has developed a few tools that we think can help managers evaluate their landscapes to determine areas of high suppression difficulty and to identify potential control locations.



Further reading: <u>https://www.fs.usda.gov/treesearch/pubs/50797</u>; <u>https://www.fs.usda.gov/treesearch/pubs/52280</u>; <u>https://www.fs.usda.gov/treesearch/pubs/54858</u>; <u>http://www.mdpi.com/1999-4907/8/12/469/htm</u>

MEMORANDUM OF UNDERSTANDING FOR COLLABORATION AND COORDINATION TO IMPROVE FOREST HEALTH AND **REDUCE WILDFIRE RISK IN BOULDER COUNTY, COLORADO** Between **BOULDER COUNTY** AND **COLORADO PARKS &** WILDLIFE AND THE COLORADO STATE FOREST SERVICE AND THE CITY OF LONGMONT AND THE CITY OF BOULDER AND THE BOULDER COUNTY **COMMUNITIES OF** NEDERLAND, GOLD HILL, LYONS, WARD AND **JAMESTOWN** AND THE LONGMONT CONSERVATION DISTRICT AND THE BOULDER VALLEY **CONSERVATION DISTRICT** AND THE BOULDER COUNTY **FIREFIGHTERS ASSOCIATION** AND THE COLORADO FOREST **RESTORATION INSTITUTE AT COLORADO STATE UNIVERSITY AND THE** UNITED STATES DEPARTMENT OF AGRICULTURE, FOREST SERVICE, ARAPAHO AND ROOSEVELT NATIONAL FORESTS AND PAWNEE NATIONAL GRASSLAND

THIS MEMORANDUM OF UNDERSTANDING (MOU) is hereby made and entered into by and between Boulder County, hereinafter referred to as "Boulder County," Colorado Parks & Wildlife, hereinafter "CPW," The Colorado State Forest Service, hereinafter referred to as "CSFS," the City of Longmont, hereinafter referred to as "Longmont," the City of Boulder, hereinafter referred to as "Boulder," the town of Nederland, hereinafter referred to as "Nederland," the town of Lyons, hereinafter referred to as "Lyons," the community of Gold Hill, hereinafter referred to as "Gold Hill," the town of Ward, hereinafter referred to as "Ward," the town of Jamestown, hereinafter referred to as "Jamestown," the Longmont Conservation District and the Boulder Valley Conservation District, hereinafter referred to together as the "Conservation Districts," the Boulder County Firefighters Association, hereinafter referred to as "BCFFA," the Colorado Forest Restoration Institute at Colorado State University, hereinafter referred to as "CFRI," and the United States Department of Agriculture (USDA), Forest Service, Arapaho and Roosevelt National Forests and Pawnee National Grassland, hereinafter referred to as the "U.S. Forest Service," and individually as "a Party," and collectively as "the Parties."

Background:

The total area of Boulder County, Colorado is approximately 740 square miles or 473,600 acres. 207,731 acres fall within the lower and upper montane life zones where the risk for catastrophic forest fires are the highest. This forested landscape includes significant communities and businesses, provides water supply to over 300,000 downstream residents as well as agricultural interests, hosts extensive outdoor recreation infrastructure and opportunities, and provides habitat for over 90 species of birds, large mammals, and native plants.

Boulder County has witnessed several major destructive wildfires over the last 40 years. These fires have collectively destroyed more than 260 homes, burned an area of more than 16,000 acres and threatened the lives and properties of thousands of mountain residents. Wildfires have always been a natural occurrence in Boulder County, but various land management practices, including fire suppression, over the last century has resulted in forests with vegetation densities 10 to 100 times their natural state. Combine this with factors such as steep terrain, drought, high summertime temperatures, seasonal high winds, and an increased human presence in the form of development and recreational use, and the result is an environment prone to extreme wildfire behavior. These very dangerous conditions have led to fires which are more numerous and devastating than ever before, challenging the abilities and resources of agencies that fight fire.

As stated by the Colorado Forest Restoration Institute, a Party to this agreement, in its 2018 Annual Report,

Fire is an essential part of how forests renew and sustain. However, historic land uses and decades of fire suppression has excluded fire from millions of forested acres of in Colorado and across the western United States. Since the early 1990s, the size and severity of wildfires have increased; human land use and development in fire-prone forests have also expanded. This combination of factors has resulted in the loss of life, property, and highly-valued natural, social, and economic assets from wildfires. This is forecasted to continue due to increases in average annual temperatures and the frequency, duration, and severity of drought.

Boulder County and the U.S. Forest Service together convened a number of government and non-government entities in 2019 to consider how they all could better align their efforts to enhance forest health in Boulder County and minimize the real potential for catastrophic wildfire. Improving forest health and community protection across the ownership and management boundaries of large landscapes by better aligning collaborative efforts is supported by a number of county, state and federal policies.

For example, the National Cohesive Wildland Fire Management Strategy adopted in 2014 by federal agencies, states, counties, fire chiefs and others, calls for a collaborative process with active involvement of all levels of government and non-governmental organizations, as well as the public, to seek national, public and private land solutions to wildland fire management issues. The Boulder County Comprehensive Plan states that the County should encourage interjurisdictional and interagency cooperation to further the goals of protection of life and property from wildfires. Additionally, in October 2019, Colorado Governor Jared Polis signed a Shared Stewardship agreement with the U.S. Department of Agriculture that oversees the U.S. Forest Service. The agreement establishes a framework for federal and state agencies to collaborate better, focus on accomplishing mutual goals, align their efforts, and respond to ecological, natural resource, and recreational challenges and concerns across the 24 million acres of forest lands in Colorado.

Finally, as a result of the threat of catastrophic wildfire and the multijurisdictional/ownership landscape in Boulder County, local forestry-related collaboratives (the "Collaboratives") have been established to help bring the Parties and others together to better align their efforts:

The Left Hand Watershed Center (the "Watershed Center") works to protect and restore watersheds in Boulder County using a collaborative and science-based approach. The Watershed Center leads the St. Vrain Forest Health Partnership to bring together diverse stakeholders and community members to collaboratively plan and implement cross-jurisdictional landscape-scale forest restoration projects that prepare the landscape and community to receive wildland fire as a natural part of the ecosystem. The Partnership involves over 30 stakeholders including the local towns of Ward, Jamestown, Lyons, and Allenspark.

The Boulder County Forest Collaborative (the "Forest Collaborative") was formed in 2019 as an effort to increase and improve the resiliency of Boulder County's forested landscapes and communities. The Forest Collaborative strives to facilitate the engagement of agencies and communities in collaborative, cross jurisdictional planning and implementation of forest health and fire mitigation projects, to increase networking opportunities and to leverage resources, funding and expertise to accomplish landscape scale projects. *The Boulder Watershed Collective (the "BWC")*, formerly the Fourmile Watershed Coalition, works to protect and restore the health, function and resiliency of the Boulder Creek watershed and to support the communities within it. BWC works alongside many local, state and federal partners similarly committed to cultivating environmental leadership, healthy ecosystems, community vitality and an inclusive vision for the future of Colorado's watersheds.

Parties and Their Current Efforts:

In the over 200,000 forested acres in Boulder County, the Parties actively work to improve forest health and reduce wildfire risk as follows:

Boulder County, through its Parks & Open Space Department, manages over 30,000 acres of forestland in these higher risk areas. Boulder County owned forests are adjacent to many mountain residents and US Forest Service land and include 70+ miles of scenic and recreational trails in the foothills and to the west.

The County's Comprehensive Plan, Land Use Code and Building Code recognize the importance of preparing for wildfires and require wildfire mitigation for new homes and additions. Boulder County's Wildfire Partners, Community Forestry Sort Yards and community chipping programs help support resident efforts to reduce wildfire risk on private lands. Boulder County is working closely with private landowners through Wildfire Partners, a mitigation program helping homeowners prepare for wildfire. Wildfire Partners is a nationally recognized model for wildfire mitigation that is incorporated into the county's building code.

The United States Forest Service Arapaho and Roosevelt National Forest Pawnee National Grasslands Boulder Ranger District encompasses over 100,000 acres of the Front Range in western Boulder and northern Gilpin counties. The district includes Indian Peaks and James Peak Wilderness Areas and the Peak to Peak Scenic Byway.

The City of Boulder directly manages over 10,000 acres of forestland in the Wildland/Urban interface and depends on healthy functioning forests on an additional 44,000 acres in Boulder County for drinking water quality and quantity. City of Boulder-owned forests are a diverse and complex mix of ecosystems that provide a unique combination of resources. A large portion of the city owned forestland is a designated State Natural Area due to its unique natural resources and there are over 70 miles of trails and diverse recreational opportunities that are an essential part of the Boulder community.

The City's Forest Ecosystem Management Plan, Community Wildfire Protection Plan, Open Space and Mountain Parks Master Plan, and Source Water Protection Plan all recognize and work to protect the important forest resources managed by the City of Boulder, Boulder County and the USFS. The city has been actively and adaptively managing and improving forest health in City owned forests through prescriptive burning and thinning for over 25 years.

The City of Longmont manages Button Rock Preserve, an approximately 3,000 acre

property encompassing Ralph Price Reservoir, Longmont Dam, a section of North St. Vrain Creek, and forested foothills in the Saint Vrain Creek watershed. The area is adjacent to private lands, Boulder County, and USFS land. The Preserve protects Longmont's primary drinking water source, providing water to more than 100,000 residents.

Forestry mitigation efforts at the Preserve started in 2004 and continue annually. Longmont's Forest Stewardship Plan and Button Rock Preserve Management Plan (anticipated completion in December 2020) highlight the importance of restoring and managing forest health to promote resiliency, to better protect nearby homes, and to protect water infrastructure by mitigating erosion and sedimentation risks occurring after floods and wildfires.

The Boulder County communities of **Nederland, Gold Hill, Lyons, Jamestown and Ward** focus on forest health and community protection efforts in and nearby their jurisdictions. They also participate in one or more of the collaboratives operating in the county: The Watershed Center's St. Vrain Forest Health Partnership, the Boulder County Forest Collaborative, and/or the Boulder Watershed Collective.

Colorado Parks & Wildlife's mission is to perpetuate the wildlife resources of the state, to provide a quality state parks system, and to provide enjoyable and sustainable outdoor recreation opportunities that educate and inspire current and future generations to serve as active stewards of Colorado's natural resources. CPW is a nationally recognized leader in conservation, outdoor recreation and wildlife management. The agency manages 42 state parks, all of Colorado's wildlife, more than 300 state wildlife areas and a host of recreational programs.

The Colorado State Forest Service's mission is to achieve stewardship of Colorado's diverse forest environments for the benefit of present and future generations. CSFS is a service and outreach agency of the Warner College of Natural Resources at Colorado State University. The Boulder Field Office serves landowners and communities in Boulder and Gilpin Counties and the surrounding areas.

CSFS provides assistance to the citizens and communities of Colorado through the development and delivery of fuels and forest management programs, outreach, publications, and project implementation with a focus on improving forest health and resiliency and reducing the threat of catastrophic wildfire. Activities that contribute to modified fuel profiles and improved forest condition that makes stands of trees and forests more resistant to wildfire and forest pests are critical focus areas for CSFS. Partnerships and collaboration provide CSFS with the opportunity to affect the necessary changes in forest health to target resilient landscapes and ecosystems.

Boulder County Fire Fighter Association (Mountain Chiefs) is a 501(c)(3) educational group, comprised largely of fire districts and rescue agencies that operate in Western Boulder County. Its mission is to provide a forum for education and operation guidance for emergency response in Boulder County. BCFFA has become a platform as well for wildfire prevention by way of community education, cross boundary mitigation support and an

arena for frank discussion on effective and ineffective mitigation methods as well as methods to gain public support.

The Boulder Valley and Longmont Conservation Districts are two of 76 conservation districts in Colorado created out of the dust bowl era to champion locally-led natural resources conservation. Partnerships with the Natural Resources Conservation Service (NRCS) and the Colorado State Conservation Board allow conservation districts to offer technical and financial assistance to private landowners addressing natural resource concerns on all land uses.

The Conservation Districts, in partnership with the National Association of Conservation Districts and the NRCS, have created a Forest and Watershed Program to address resource concerns on forested private lands in Boulder County. The program is staffed by a Conservation Forester who provides technical assistance to complete forest assessments which identify the suite of resource concerns, develop forest management plans, identify and secure funding, and implement projects. The program also offers technical assistance to collaborative groups, watershed coalitions, communities, and others to assist with data/analysis, strategic planning, community engagement, workshops and education.

Colorado Forest Restoration Institute, Colorado State University (CSU) was established through the Southwest Forest Health and Wildfire Prevention Act passed by Congress in 2004 and chartered by the Western Governors' Association and the CSU president in 2005. CFRI's mission is to develop, compile, translate, and apply locally-relevant scientific knowledge to achieve forest restoration and wildfire risk mitigation goals in the Intermountain West. At the request of several entities in Boulder County, CFRI has been supporting science-based and collaborative decision-making and adaptive management for forest restoration and wildfire risk management for over a decade.

The Parties and others at the initial 2019 Boulder County meetings agreed that it would be helpful to capture their views on what they collectively seek to achieve across the forested areas of the county. It was also recognized and unanimously agreed upon that forested communities, downstream communities and stakeholders directly or indirectly impacted by declining forest health and potential catastrophic wildfire should be part of the process over time to refine a vision for the future of forests in the county.

Vision and Outcomes

The Parties together preliminarily agreed on the following vision and outcomes:

- Meaningful and ongoing engagement of stakeholders located in the forest and downstream in the development of strategies to achieve the outcomes and foster support for the implementation of those strategies.
- A regional network of resilient forests that are better able to absorb and recover from current and future stressors and disturbances.

- A collaboratively developed and supported fire management strategy (wildland and prescribed) so that wildfires are safely and effectively extinguished when and where needed, but also in the right circumstances, permits wildland fire to be more flexibly managed in order to reduce future risks to life, property, and wildlife habitat.
- Resilient forest ecosystems that support water quality and quantity needs, habitat for robust and healthy flora and fauna as well as recreation opportunities for Boulder County residents and visitors to enjoy now and in the future.
- Active management to enhance forest health and reduce wildfire risk based on the best available data and contemporary science to inform the development and application of on-the-ground activities including landscape scale and cross boundary projects where needed. This includes the use of the best available climate science that will help stakeholders understand how a changing climate will impact our forests.
- Promoting the personal responsibility of residents who live in wildfire risk areas to prepare as follows: homes are built or improved to best resist wildfire, defensible space around homes is created and maintained, insurance policies are regularly updated, emergency alerts are receivable and acted upon, evacuation plans are learned and understood, community mitigation initiatives are engaged in and, Wildfire Partners Certificates, issued by Boulder County, are sought.

I. PURPOSE:

This MOU establishes a collaborative framework for the Parties to set mutual goals and priorities where necessary, utilize existing forest management tools and legal authorities, and align their decisions on where to make the investments needed to achieve the vision and outcomes set forth above on the forested landscapes in Boulder County.

II. STATEMENT OF MUTUAL BENEFIT AND INTERESTS:

The Parties recognize, accept, and respect the differences in missions, goals, and objectives of each other and among landowners in the county. However, wildfires, insect outbreaks, flood events and other disturbances do not recognize or respect landownership boundaries. The Parties therefore will work collaboratively and in a coordinated fashion to achieve the outcomes sought and described above.

The Parties acknowledge that any Party to this MOU may participate in local activities or implement decisions related to forestry management as part of their site-specific obligations, responsibilities and authorities. This MOU is not meant to supplant any Party's discretionary authority to make decisions about forest management or wildfire response associated with their individual jurisdictions. This MOU does not obligate funds of any of the Parties.

In consideration of the premises set forth above, each of the Parties commits to:

- A. Work within their own statutory and regulatory authorities, including planning, National Environmental Policy Act and decision-making requirements, where applicable.
- B. Collaborate and coordinate to implement this MOU to achieve the vision and objectives expressed herein.

III. IT IS MUTUALLY UNDERSTOOD AND AGREED BY AND BETWEEN THE PARTIES THAT:

- A. As funding and resources are available and authorized (as determined in each Party's sole discretion), the Parties will provide technical, human and financial support to achieve the vision and outcomes of this MOU, including, but not limited to:
 - 1. Support and work with existing and future forest-focused collaborative organizations to outreach and engage stakeholders to increase understanding and together refine the vision and outcomes detailed herein.
 - 2. Expeditiously create a Boulder County map of forested lands that will be a basis for Parties to do outreach, priority setting and decision making. Consider on-going data management and governance needs, costs, and seek to maximize public facing information.
 - 3. Establish and support a multi-disciplinary Science Team of the Parties and other representatives with varying perspectives that identifies priority areas (regardless of boundaries) in need of active forest management. The Science Team should consider creating a cross boundary treatment prescriptions "playbook" for ease of planning, approvals and grant seeking. The Science Team is to develop protocols and methods to support monitoring and adaptive management of on-the-ground crossboundary forest management actions.
 - 4. Establish and support a Communications and Education Team of the Parties and others to use the information developed by the Science Team and otherwise support the work of the collaborative organizations and ensure consistent messaging to the public and media by the Parties. Public education focused on proper and improper forest uses related to wildfire prevention and stewardship should also be a focus of the Communications and Education Team.
 - 5. Through the Collaboratives, the Parties and others will together initiate stakeholder outreach, planning, and fundraising on a cross boundary

landscape scale forest health and/or community protection project that meets the objectives of this agreement with implementation to commence in 2021/22.

- 6. The Parties will build, continually improve and host a map of Potential Operational Delineations (PODs) that spans the entire county. A PODs map identifies the safest and most effective control lines used to contain wildfire and can assist in integrating land management objectives and incident response while improving outreach to and education of the public.
- 7. The Parties will seek to increase the capacity of county fire districts so that they can play a greater role in outreach and engagement with stakeholders and in the implementation of small and large scale projects that include private land and defensible space/home improvements.
- 8. An Executive Committee of the Parties will meet no less than twice a year to gauge progress under this MOU. Goals, measures and timelines should be provided to the Executive Committee by each of the Science, Communications/Education and project teams once they have been established. The Executive Committee will also oversee progress on creating and maintaining a map of the county's forested lands and PODs.
- B. Consider entering into separate agreements, as resources allow, to accomplish agreed upon projects to help achieve the vision and outcomes in this MOU.
- C. Review, revise, update and re-adopt this MOU every five years after its initial adoption. If all the current Parties to the MOU concur, new signatories may become a Party to the MOU at any time.
- D. <u>PRINCIPAL CONTACTS</u> Individuals listed below are authorized to act in their respective areas for matters related to this agreement.

Boulder County Program Contact	Boulder County Administrative Contact
Name: Deb Gardner	Name: Michelle Krezek
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Email: dgardner@bouldercounty.org	Email: mkrezek@bouldercounty.org

Principal Boulder County Contacts:

Principal U.S. Forest Service Contacts:

U.S. Forest Service Program Contact	U.S. Forest Service Administrative
	Contact
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Principal City of Boulder Contacts:

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Principal City of Longmont Contacts:

City of Longmont Program Contact	City of Longmont Administrative		
	Contact		
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Principal Towns and Communities of Nederland, Gold Hill, Lyons, Jamestown And Ward Contacts:

Boulder Watershed Collective	Left Hand Watershed Center
Program/Administrative Contact	Program/Administrative Contact

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Principal Colorado Parks & Wildlife Contacts:

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	Contact
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Principal Colorado State Forest Service Contacts:

CSFS Program Contact	CSFS Administrative
	Contact
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Principal Boulder Valley and Longmont Conservation District Contacts:

Conservation Districts Program Contact	Conservation Districts Administrative
	Contact
Name: Chad Julian, Conservation Forester	Name: Vanessa McCracken, District Mgr.
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CFRI Program Contact	CFRI Administrative
	Contact
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Principal Colorado Forest Restoration Institute Contacts:

E. NOTICES. Any communications affecting the operations covered by this agreement given by the U.S. Forest Service or Parties is sufficient only if in writing and delivered in person, mailed, or transmitted electronically by e-mail or fax, as follows:

To the U.S. Forest Service Program Manager, at the address specified in the MOU.

To Parties, at Party's address shown in the MOU or such other address designated within the MOU.

Notices are effective when delivered in accordance with this provision, or on the effective date of the notice, whichever is later.

- F. PARTICIPATION IN SIMILAR ACTIVITIES. This MOU in no way restricts the U.S. Forest Service or other Parties from participating in similar activities with other public or private agencies, organizations, and individuals.
- G. ENDORSEMENT. Contributions of Parties made under this MOU do not by direct reference or implication convey U.S. Forest Service endorsement of Parties products or activities.
- H. <u>NONBINDING AGREEMENT</u>. This MOU creates no right, benefit, or trust responsibility, substantive or procedural, enforceable by law or equity. The parties shall manage their respective resources and activities in a separate, coordinated and mutually beneficial manner to meet the purpose(s) of this MOU. Nothing in this MOU authorizes any of the Parties to obligate or transfer anything of value.

Specific, prospective projects or activities that involve the transfer of funds, services, property, and/or anything of value to a Party requires the execution of separate agreements and are contingent upon numerous factors, including, as applicable, but not limited to: agency availability of appropriated funds and other resources; Party availability of funds and other resources; agency and Party administrative and legal requirements (including agency authorization by statute); etc. This MOU neither provides, nor meets these criteria. If the Parties elect to enter into an obligation agreement that involves the transfer of funds, services, property, and/or anything of value to a Party, then the applicable criteria must be met. Additionally, under a

prospective agreement, each Party operates under its own laws, regulations, and/or policies, and any U.S. Forest Service obligation is subject to the availability of appropriated funds and other resources. The negotiation, execution, and administration of these prospective agreements must comply with all applicable law.

Nothing in the MOU is intended to alter, limit or expand the agency's statutory and regulatory authority. Nothing herein shall be construed or interpreted as a waiver, express or implied, of any of the notice requirements, defenses, immunities and limitations of liability that the Parties and their respective officers and employees may have under the Colorado Governmental Immunity Act (C.R.S. Section 24-10-101, et seq.) and under any other law.

- I. <u>USE OF U.S. FOREST SERVICE INSIGNIA</u>. In order for the Parties to use U.S. Forest Service insignia on any published media such as Web pages, printed publications or audiovisual production, permission must be granted in writing from the U.S. Forest Service Office of Communications (Washington Office) prior to use of the insignia.
- J. MEMBERS OF U.S. CONGRESS. Pursuant to 41 U.S.C. 22, no U.S. member of, or U.S. delegate to, Congress shall be admitted to any share or part of this agreement, or benefits that may arise therefrom, either directly or indirectly.
- K. <u>COLORADO OPEN RECORDS ACT</u>. Nothing in the agreement shall be deemed to waive or modify any public access or provision of the Colorado Open Records Act.
- L. FREEDOM OF INFORMATION ACT (FOIA). Public access to MOU or agreement records must not be limited, except when such records must be kept confidential and would have been exempted from disclosure pursuant to Freedom of Information regulations (5 U.S.C. 552) or the Colorado Open Records Act, as applicable.
- M. TEXT MESSAGING WHILE DRIVING. In accordance with Executive Order 13513, "Federal Leadership on Reducing Text Messages While Driving," any and all text messaging by Federal employees is banned: a) while driving a Government owned vehicle (GOV) or driving a privately owned vehicle (POV) while on official Government business; or b) using any electronic equipment supplied by the Government when driving any vehicle at any time. All Parties, their employees, volunteers, and contractors are encouraged to adopt and enforce policies that ban text messaging when driving company owned, leased or rented vehicles, POVs or GOVs when driving while on official Government business or when performing any work for or on behalf of the Government.
- N. <u>U.S. FOREST SERVICE ACKNOWLEDGED IN PUBLICATION, AUDIOVISUAL</u> AND ELECTRONIC MEDIA. Parties shall acknowledge U.S. Forest Service support in any publications, audiovisuals, and electronic media developed as a result of this MOU.
- O. NONDISCRIMINATION STATEMENT PRINTED, ELECTRONIC OR AUDIOVISUAL MATERIAL. Parties shall include the following statement, in full, in

any printed, audiovisual material, or electronic media for public distribution developed or printed with any Federal funding.

In accordance with Federal law and U.S. Department of Agriculture policy, this institution is prohibited from discriminating on the basis of race, color, national origin, sex, age, or disability. (Not all prohibited bases apply to all programs.)

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If the material is too small to permit the full statement to be included, the material must, at minimum, include the following statement, in print size no smaller than the text:

"This institution is an equal opportunity provider."

- P. TERMINATION. Any of the Parties, in writing, may terminate their commitment to this MOU at any time before the date of expiration. Termination by a Party or Parties will not result in termination of the MOU itself.
- Q. DEBARMENT AND SUSPENSION. Parties shall immediately inform the U.S. Forest Service if they or any of their principals are presently excluded, debarred, or suspended from entering into covered transactions with the federal government according to the terms of 2 CFR Part 180. Additionally, should Parties or any of their principals receive a transmittal letter or other official Federal notice of debarment or suspension, then they shall notify the U.S. Forest Service without undue delay. This applies whether the exclusion, debarment, or suspension is voluntary or involuntary.
- R. <u>MODIFICATIONS</u>. Modifications within the scope of this MOU must be made by mutual consent of the Parties, by the issuance of a written modification signed and dated by all properly authorized, signatory officials, prior to any changes being performed. Requests for modification should be made, in writing, at least 30 days prior to implementation of the requested change. However, per Section III, paragraph C above, with concurrence of all the current Parties, new Parties may be added to the MOU at any time by a single duly authorized signature of the new Party.
- S. <u>COMMENCEMENT/EXPIRATION DATE</u>. This MOU is executed as of the date of the last signature and is effective through five years from the date of the last signature, at which time it will expire unless it is renewed.
- T. AUTHORIZED REPRESENTATIVES. By signature below, each Party certifies that the individuals listed in this document as representatives of the individual Parties are authorized to act in their respective areas for matters related to this MOU.

In witness whereof, the Parties hereto have executed this MOU on August 13, 2020.

DEB GARDNER DATE County Commissioner, Boulder County MARK LESLIE DATE NE Regional Manager, Colorado Parks & Wildlife MIKE LESTER DATE State Forester, Colorado State Forest Service JANE BRAUTIGAM DATE City Manager, The City of Boulder KRISTOPHER LARSEN DATE Mayor, Town of Nederland MARIELLE SIGELLE DATE

Council Chair, Town of Gold Hill

BRET GIBSON President, Boulder County Firefighters Association

ANNE HANSEN President, Longmont Conservation District

DAN LISCO President, Boulder Valley Conservation District

TONY CHENG Director, Colorado Forest Restoration Institute

MONTE WILLIAMS Forest Supervisor, Arapaho and Roosevelt National Forest and Pawnee National Grassland, U.S. Forest Service

Burden Statement

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0596-0217. The time required to complete this information collection is estimated to average 3 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

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DATE

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Version: 10/6/19

Meadow Name	Date : / / / MM DD YYYY
GPS Location: NW GPS Datum (e.g., WGS 84, NAD 27)	
Elevation (m) Slope (°) County	
Watershed (HUC8) Landowner	
USGS Quad Name 7.5	or 15' (circle one)
Observers:	

	CONDITION CATEGORY					
Parameter	Natural Condition	Slightly impacted	Moderately Impacted	Heavily Impacted		
1. Bank Height in Main Channel (measured in the riffle).	Little or no channel incision, Banks 0-2 feet high along >95% of the channel length.	Bank heights of 2-4 feet along less than 25% of the channel length; 0-2 feet elsewhere.	Bank heights of 2-4 feet along 25% or more of channel length; higher than 4 feet along less than 25% of channel length.	Bank heights > 4 feet along 25% or more of channel length. Note if sections of channel have banks 0-2 feet high.		
Score:	4	3	2	1		
Second Channel (if present):	4	3	2	1		
2. Bank Stability	<5% of bank length is unstable.	5-20% of bank length is unstable.	20-50% of bank is unstable	>50% of bank is unstable.		
Score:	4	3	2	1		
Second Channel (if present):	4	3	2	1		
3. Gullies/ditches outside of main channel	No gullies or ditches impacting hydrology outside of the main channel	Ditch or start of a gully outside of the main channel. Combined length of all gullies & ditches is less than 1/10 th meadow length.	Combined length of all gullies and ditches up to 1/2 of meadow length	Combined length of all gullies and ditches is greater than 1/2 of meadow length.		
Score:	4	3	2	1		
4. Vegetation Cover	4. Vegetation Cover Graminoids account for covered by vegetation 50-75% graminoid cover		Forbs dominate. 25-50% graminoid cover.	Forbs dominate. <25% graminoid cover.		
Score:	4	3	2	1		
5. Bare Ground	5. Bare Ground Bare ground covers less than 5% of the meadow area. Bare ground covers 5-10% of meadow area		Bare ground covers 10- 15% of meadow area.	Bare ground covers > 15% of meadow area.		
Score:	4	3	2	1		
6. Conifer or Upland Shrub Encroachment	No upland shrub or conifer encroachment. Raised, topographically distinct areas may have upland species present, but not the meadow surface.	Few encroaching upland species; <10% of total meadow area	Encroaching upland species cover 10-20% of total meadow area	Encroaching upland species cover >20% of total meadow area		
Score:	4	3	2	1		
Nord Wildlin		Divora	Total Possible Points			

Total/Possible





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Additional Observations:

14. Comments on ease of/ barriers to restoration (e.g., are impacts localized or disbursed throughout meadow, access, adjacent land use)

Additional Notes & Comments:

Meadow Name/Number _____ Date _____

Observers

	Graminoid	Forb	Bare: No Gopher	Bare: Yes Gopher	Other Cover: moss, litter, shrubs, etc.	Draw channel cross section, Label heights and widths
Upper Transect						
Middle Transect						
Lower Transect						
Sub- total	A:	В:	C:	D:	E:	

Total:	= A+B+C+D+E				
Total Veg:	= A+B				
Total Bare:	= C+D				
% Gramminoid (Question 4)		= A/Total Veg X 10	0%		
% Bare (Question 2)		= Total Bare/Total X 100%			
% Gopher Disturbed (for Add'l ?'s)		= D/Total X 100%			

Meadows Assessment Photo Log

Photo #	Description	Notes

Meadows Assessment Photo Log (Continued)

Photo #	Description	Notes

Additional Notes:

Explanation:

This scorecard uses observations of the main channel as well as observations recorded throughout the meadow. One strategy for moving through the meadow is to start at an outflow and walk a main channel to the top of the meadow, making observations of bank height (Question 1), bank stability (Question 2), headcuts or eroded tributaries (Part of Question 3, and additional observations). Walk the length of all main channels present (adding lines to Q's 1 & 2, if there are more than 2 channels, which is unusual). It may help to make notes on an aerial photograph. Also, as you walk up a channel, note vegetation patterns by looking across the meadow. Then, aided by an aerial photograph, choose toe-point transects that cross the dominant vegetation types (Questions 4 & 5). Lastly, visit areas of possible conifer encroachment along the meadow edge (6). Make notes adjusting the delineated meadow to the actual meadow bounds. Again, an aerial photograph may be useful for this task. Determining the correct meadow extent from groundtruthing is integral for calculating what percentage of meadows are over or under delineated in classified aerial imagery

Mountain Meadow Definition:

An existing mountain meadow is an ecosystem type that is currently composed of one or more plant communities dominated by herbaceous species and supports plants that use surface water and/or shallow ground water (generally at depths of less than 1 m). Woody vegetation (e.g., trees and shrubs such as Alder and Willow) may occur, and be locally dense, but are not dominant. Historical mountain meadows are areas that once supported meadow vegetation as above but have been altered either hydrologically or by disturbance or both. These alterations can be part of natural cycles or induced by human activity (D. Wiexleman, D. Cooper, E. Below). For the purposes of this rapid assessment method, the meadow should be scored based on historical meadow area when possible.

(1) **Bank Height in Main Channel:** This question applies to the main channel, which is the channel that flows parallel to the valley from the top of the meadow to the bottom. Occasionally multiple main channels may be encountered, if the meadow is at the confluence of more than one stream of nearly equal size. In these cases, score the channels separately. When in doubt, split them out.

Bank height is measured from the deepest part of the riffle to the meadow surface at the top of the bank. Areas of local incision, where a stream cuts through a raised region, such as an alluvial fan, should not be considered when scoring the channel.

In the illustrations below, series B shows a distinct low-flow channel inset within a high-flow channel. In contrast, the low-flow channel in series A floods onto the meadow surface. Note the corresponding difference in bank height measures; in both cases the bank height is measured to the vegetated meadow surface.

Meadow surface





Bank height greater than 4 feet, score=1 (Bear Valley, Bear River Watershed)



Bank height 2-4 feet, score=2 (Pacific Valley, Mokelumne Watershed)



Bank height 0-2 feet, score=4 (Austin Meadow, Yuba River Watershed)



Bank height 2-4 feet. score=2 (Hermit Valley, Mokelumne Watershed)

(2) Bank Stability. A bank is unstable if one of the following features exist: Either a (1) fracture (a crack is obvious along the top or on the face of the bank); (2) slump (a portion of the bank has slipped down as a separate block of soil or sod see B2 and B3 above); or (3) slough (soil broken away or crumbled and accumulated at the base of the bank.) or if the bank is steep (within 10 degrees of vertical), and/or bare, and eroding (including bare depositional bars).

(3) Gullies, Ditches, or Eroding Tributaries Outside Main Channel. Gullies may be the result of headcuts which have propagated upstream from an incised main channel, or they may be new channels that have formed in areas where no natural channel was present. The new channels may be due to roads, trails, or culverts concentrating flows, or the channels may be ditches purposely cut to drain portions of the meadow.



Headcut and gully forming in Freeman Meadow (Yuba Watershed)



A ditch with vegetated banks in Hope Valley (Carson Watershed).

- (4) **Vegetation Cover:** This question and the following one are derived from the toe-point transects (see description below). The % graminoid cover is a correlate for vegetation function –a measure of how much the vegetation stabilizes the soil (D. Weixelman pers. comm., J. Roccio 2006)
- (5) **Bare Ground:** The percent cover of bare ground is derived from the toe-point transects (see below). Bare ground may be soil or peat, but it is not covered by water. If the bare ground is due to gopher disturbance, the gopher activity should be noted in the Additional Observations.
- (6) Conifer or Upland Shrub Encroachment. Upland shrubs include sagebrush, rabbitbrush and ceanothus. Not included are species which are found in wet meadow and riparian areas: blueberries, alder, willow and aspen. Exclude any topographically-distinct, well-drained areas within the meadow from the extent of encroachment (see figure). Encroachment may not start at the meadow edge (e.g., encroachment on the well-drained banks of an incised tributary.)



Two areas of sagebrush (greenish) are outlined in the figure. The patch outlined in blue would be included as encroachment because it is low-lying, at the level of the meadow surface –here atop the stream bank. The patch outlined in red is on a higher terrace. Because it is above the meadow surface, this area would not be included in the estimate of encroachment.

Toe point transects:

Toe point transects are a quick method of estimating percent cover by pacing transects and making equally spaced observations at every step, or every other step, depending on the length of the transect and number of points to be sampled. A measurement is taken as follows: as the observer takes a step, a stick is held against at the toe of the boot to define the precise point of observation. Where the stick lands, the observer tallies which is present: graminoid, forb, bare ground, or other (moss, litter, woody species, etc.). Bare ground is further divided as either gopher disturbed or not obviously gopher-disturbed; see the datasheet below.

Three transects across "representative areas" of the meadow are to be taken. Take a photograph looking along the transect from the start and finish. Also photograph where the channel crosses the stream. Along each transect, the goal is to take approximately 50 equally-spaced measurements, so depending on the width of the meadow, a transect spanning the meadow (and crossing the channels) with ~50 measurements may call for sampling every step, or for large meadows, perhaps every 10th step. Complete a full transect across the meadow. If needed to complete the transect, it is acceptable to go substantially over the 50-measurement count. It is unacceptable to cut short the transect once 50 measurements have been made or to change the spacing between measurements within a transect. In each meadow, three toe-point transects will be walked; one each in the upper, middle and lower meadow. The upper meadow is where the channel enters the meadow, and the lower meadow is the lowest elevation, where the channel exits the meadow.

The data sheet has space for tallies along each transect, with space to calculate the percentages used in the scorecard. The hatching in some cells are a reminder of which cells to divide to calculate the final percentages. A cross section of the main channel should also be drawn at each transect, labeled with approximate heights and widths. Include historic terraces if the meadow has an inset floodplain.

Additional Observations:

Examples of Headcuts (also see G1 above): For headcuts, record the height of the jump, the width and the length (from top of jump to base of jump).

