

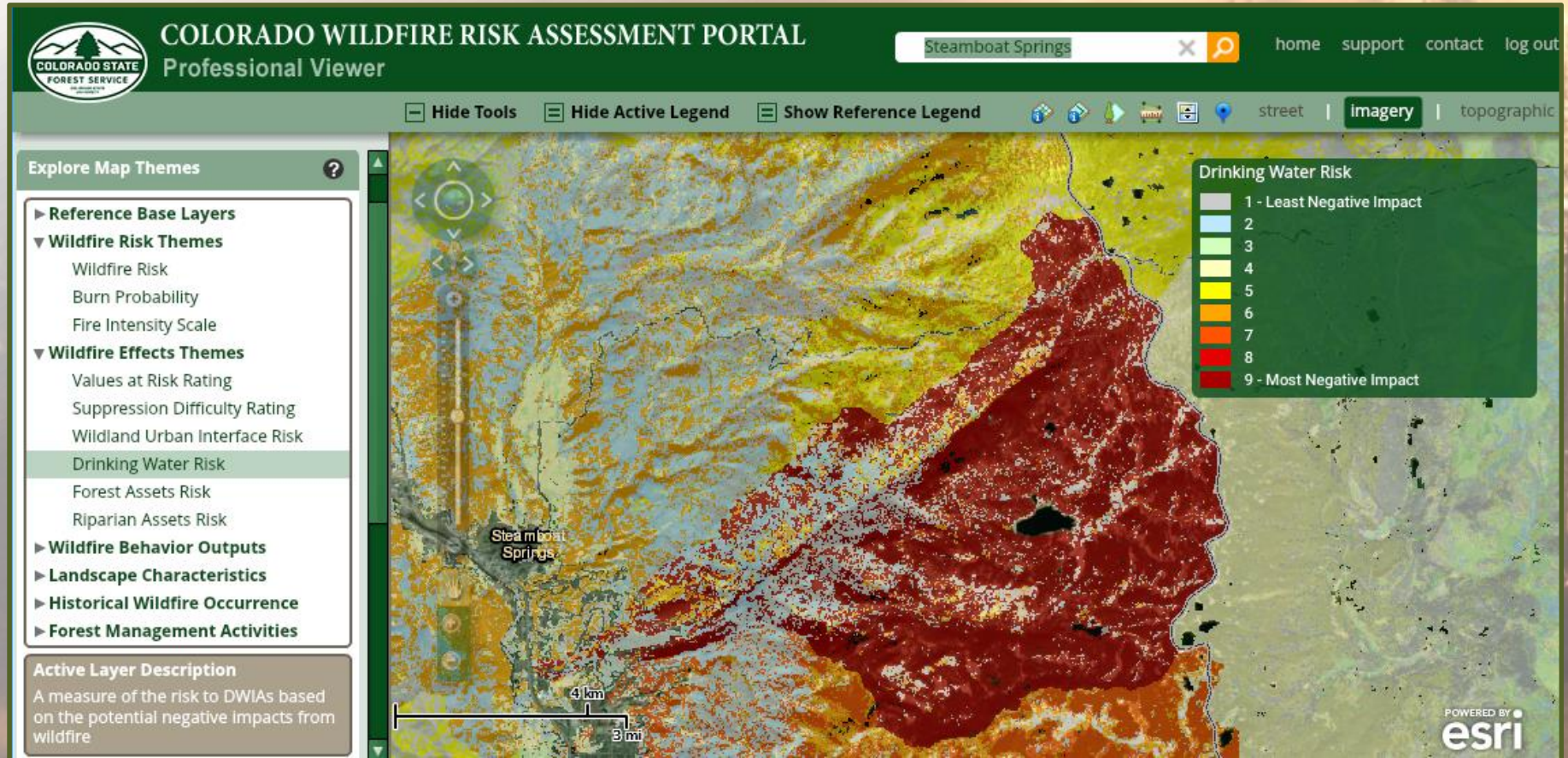
FISH CREEK (CWP)²



Fish Creek Critical Community Watershed Wildfire Protection Plan (CWP)²

City of Steamboat Springs
Mount Werner Water District
Steamboat Springs, CO

INTRODUCTION

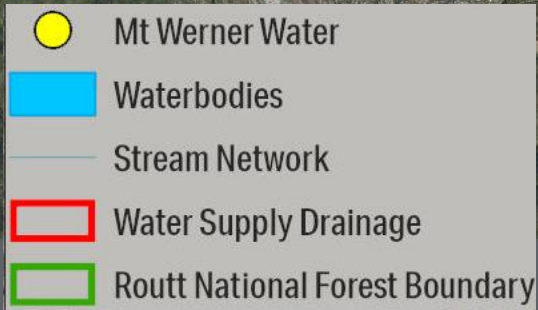
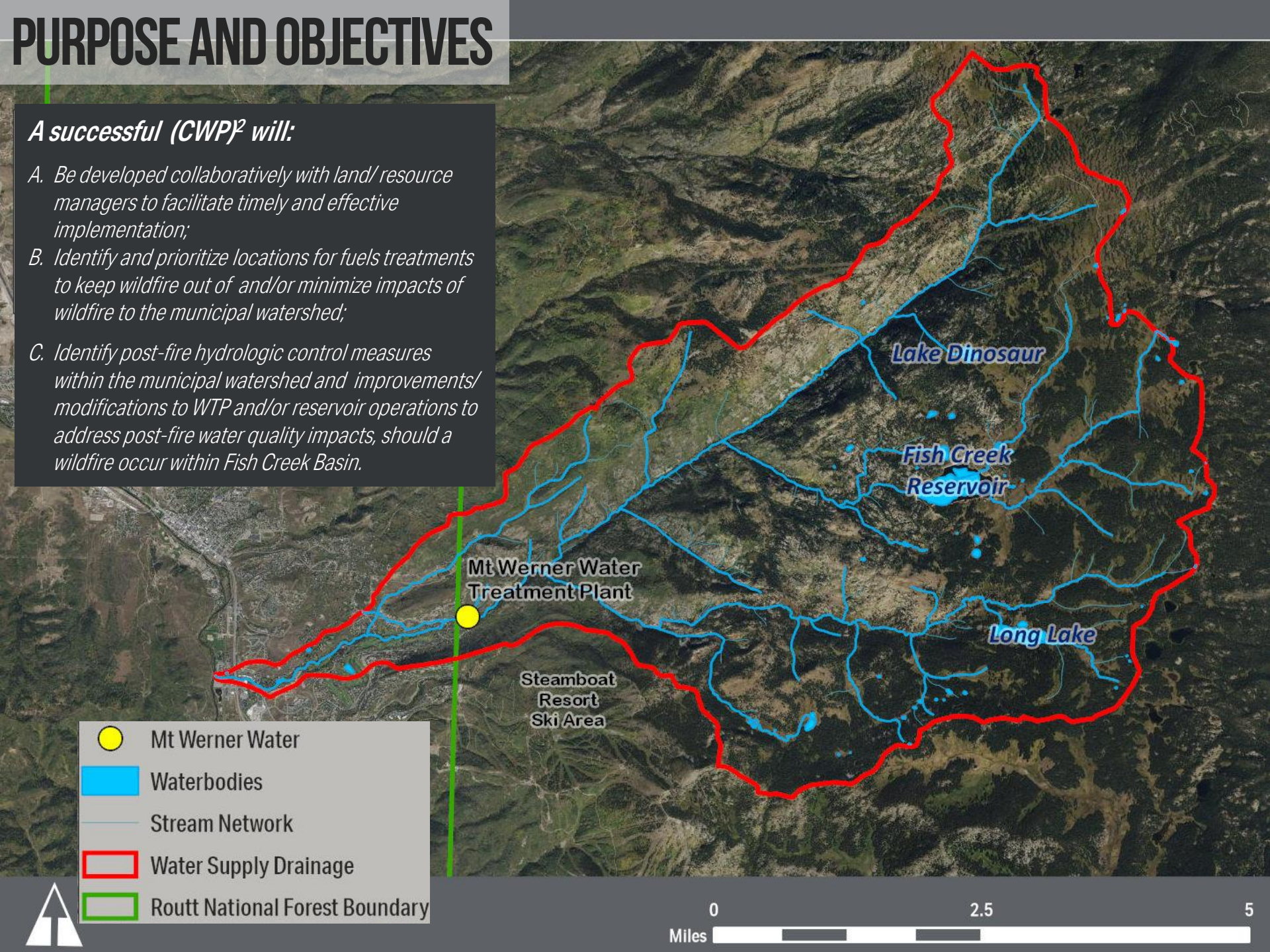


- 1) Fish Creek Watershed was identified in CSFS' Statewide Assessment as an important drinking water watershed with high potential for postfire erosion
- 2) Steamboat Springs received the first CWCB grant to develop a Critical Community Watershed Wildfire Protection Plan (CWP)² proactively address wildfire threats to drinking water.

PURPOSE AND OBJECTIVES

A successful (CWP)² will:

- A. Be developed collaboratively with land/ resource managers to facilitate timely and effective implementation;*
- B. Identify and prioritize locations for fuels treatments to keep wildfire out of and/or minimize impacts of wildfire to the municipal watershed;*
- C. Identify post-fire hydrologic control measures within the municipal watershed and improvements/ modifications to WTP and/or reservoir operations to address post-fire water quality impacts, should a wildfire occur within Fish Creek Basin.*



THE PLANNING PROCESS

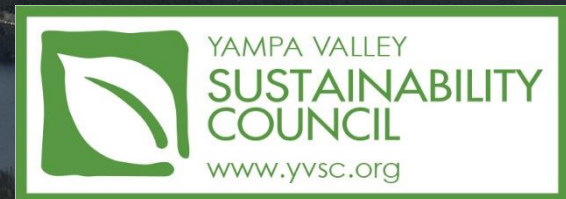
› Core Team & Key Stakeholders

› Build on Existing Efforts

- / Incorporate Existing Plan Recommendations
 - ›› Routt County CWPP
 - ›› Fish Creek – Sanctuary CWPP
 - ›› Steamboat Springs Master Plan
 - ›› Upper Yampa Watershed Plan
 - ›› Routt National Forest Plan
 - ›› Citywide Stormwater Master Plan
 - ›› Ski Resort Master Dev. Plan
 - ›› Past/ Current/ Planned Projects



Mount
Werner
Water District



WATERSHED RISK ASSESSMENT

Wildfire Hazard Analysis

› Fire Behavior Modeling (FlamMap)

- / Model Inputs
 - » RAWS (Weather)
 - » DEM (Topography)
 - » CSFS 2018 Revised (Fuels), Modified:
 - USFS Fuels Specialist
 - Field Observations

Postfire Hydrologic Hazard Analysis

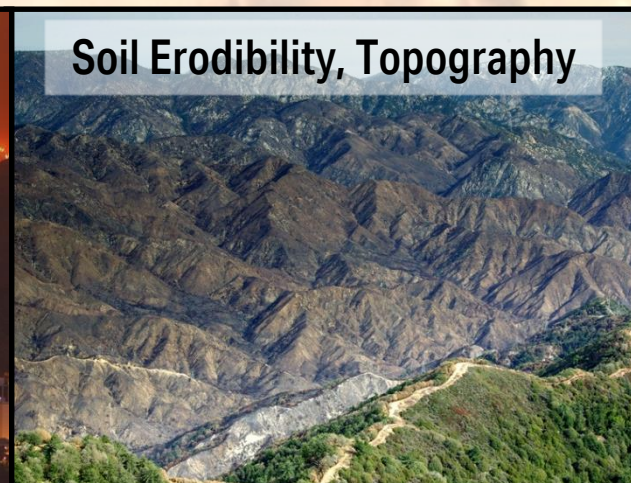
› USGS Debris Flow Models

- / Delineate Water Supply Drainage
- / Extract Model Input Variables:
 - » Precipitation Intensity, Volume
 - » Watershed's Physical Characteristics:
 - Topography – Slope, Relief
 - Soil - Clay, Liquid Limit, Organic Matter, K Factor
 - » Soil Burn Severity, dNBR
- / Calculate Probability, Volume

› Summarize Results to Determine Risk Map



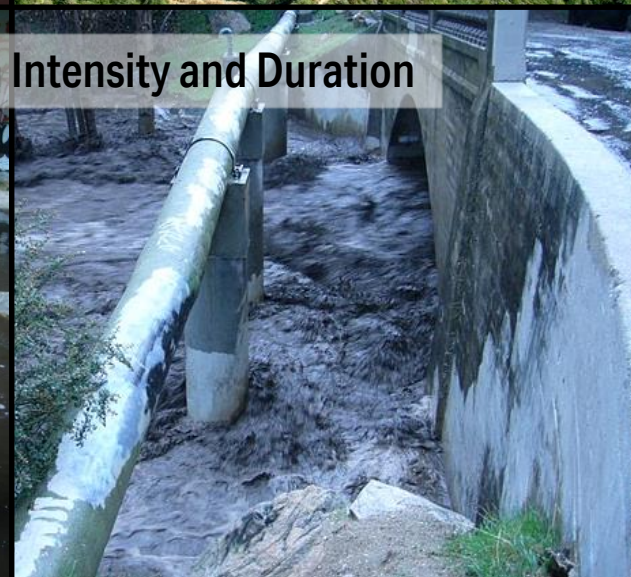
Soil Burn Severity*



Soil Erodibility, Topography

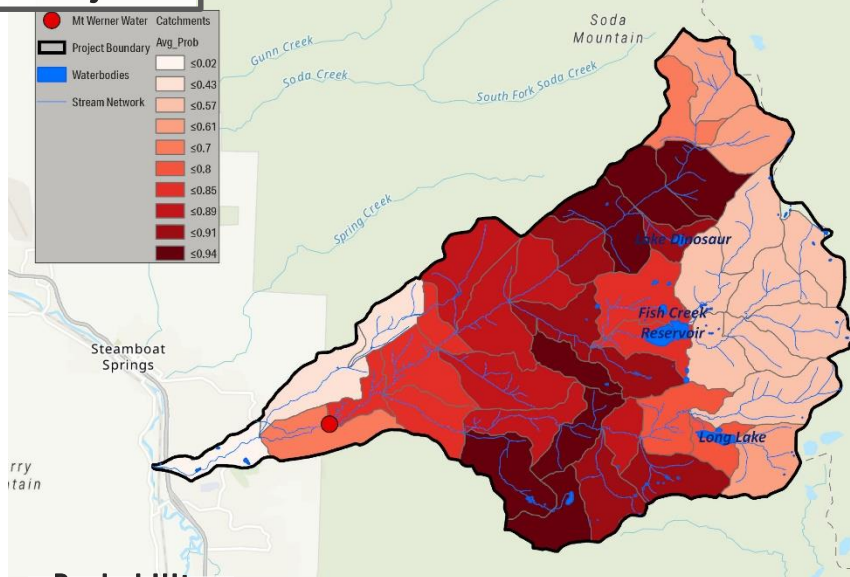


Precipitation Intensity and Duration

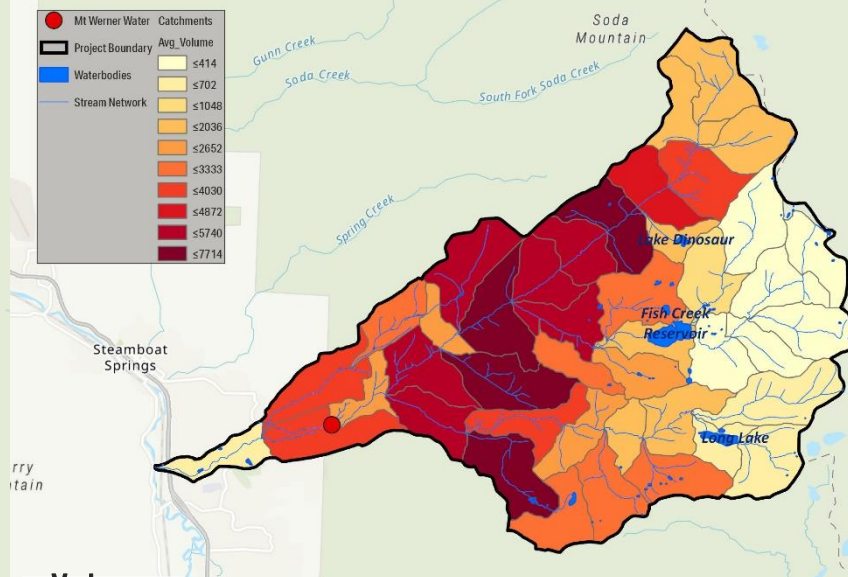


Postfire Hydrologic Hazard Analysis

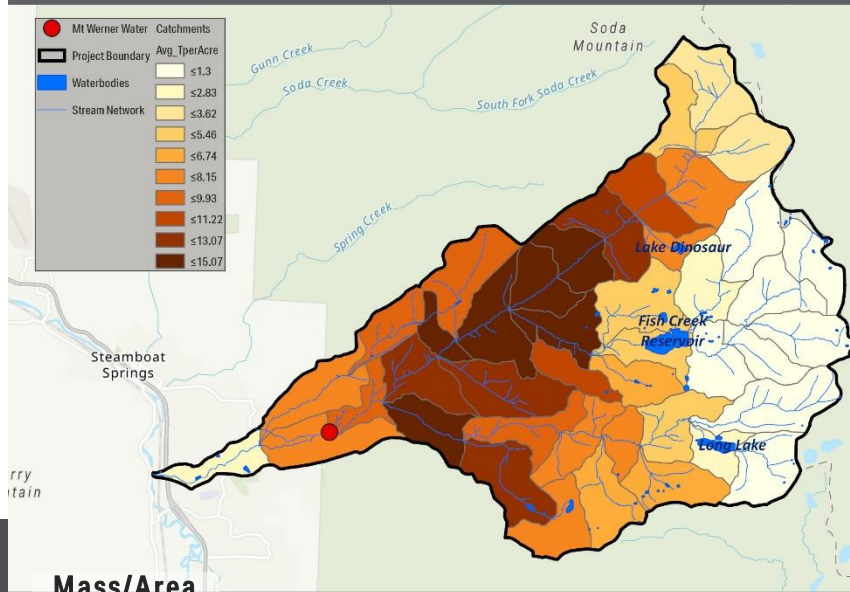
WATERSHED RISK ASSESSMENT



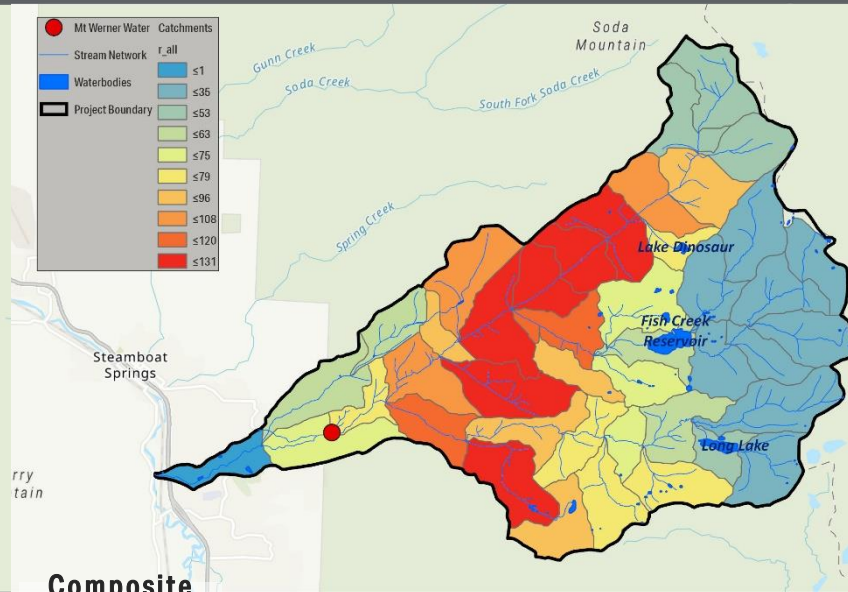
Probability



Volume



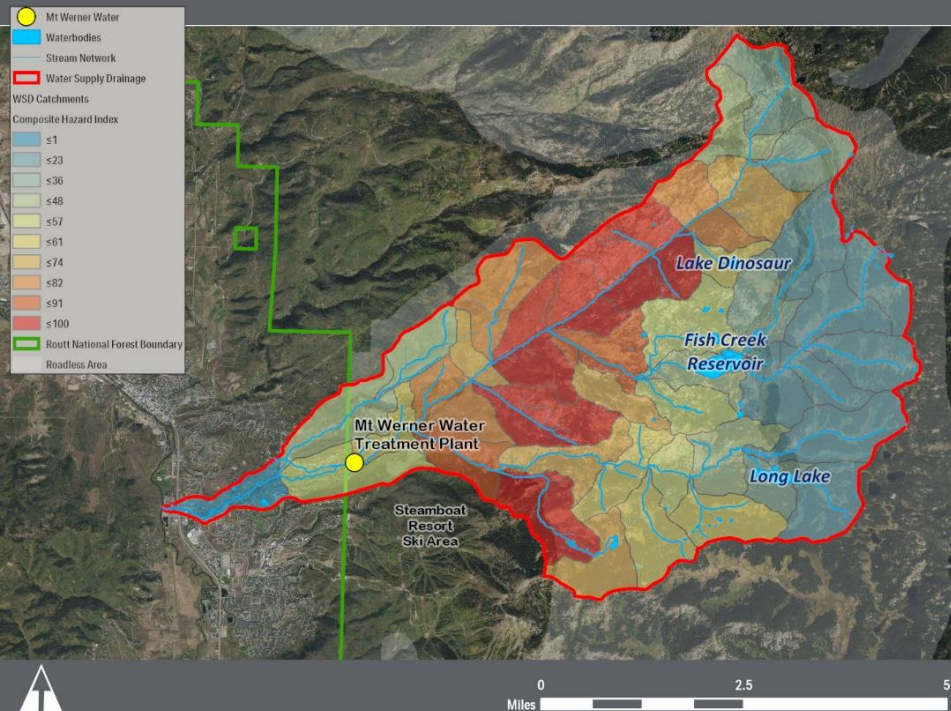
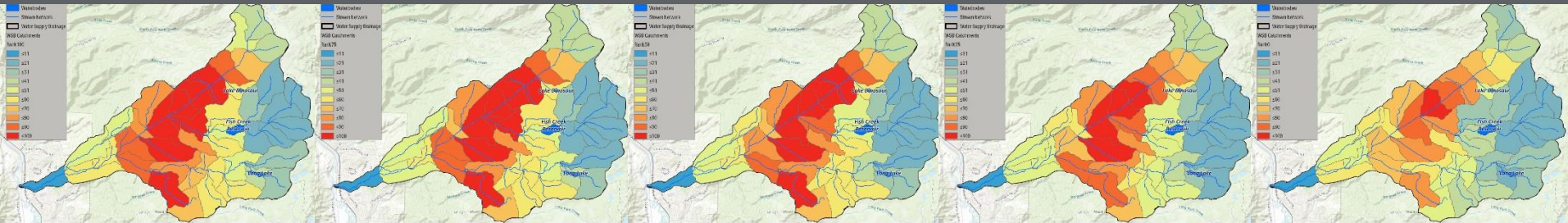
Mass/Area



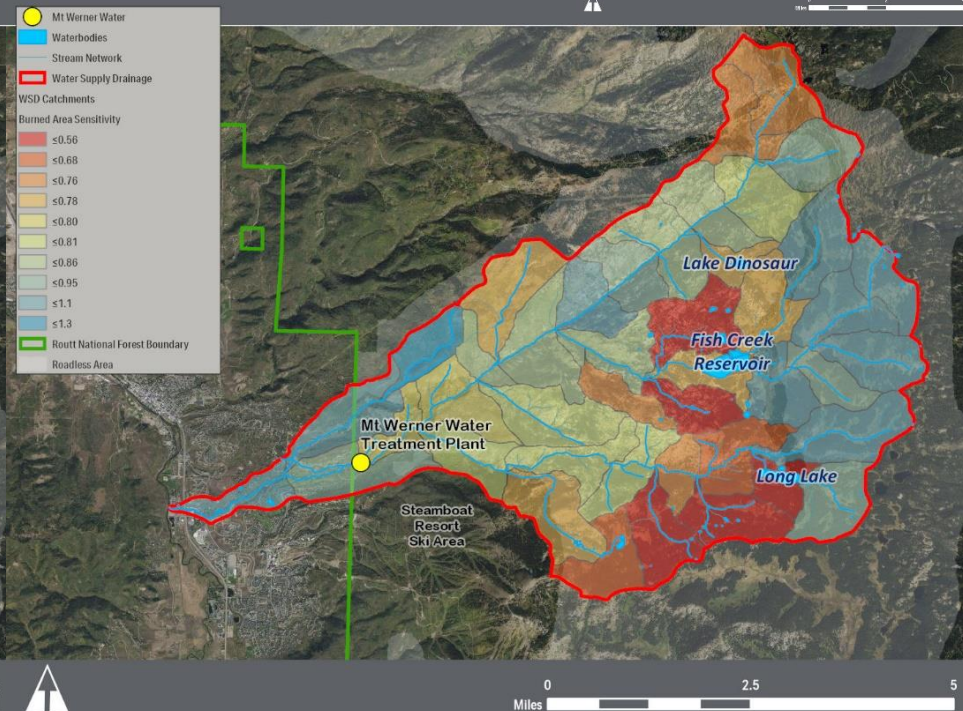
Composite

PROJECT IDENTIFICATION AND PRIORITIZATION

Reduce predicted moderate to high burn severity by 25% increments to determine where treating the landscape would be more effective

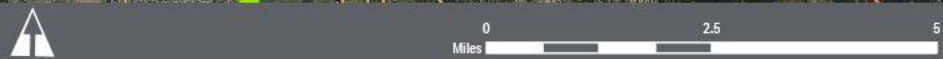
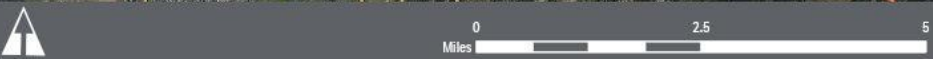
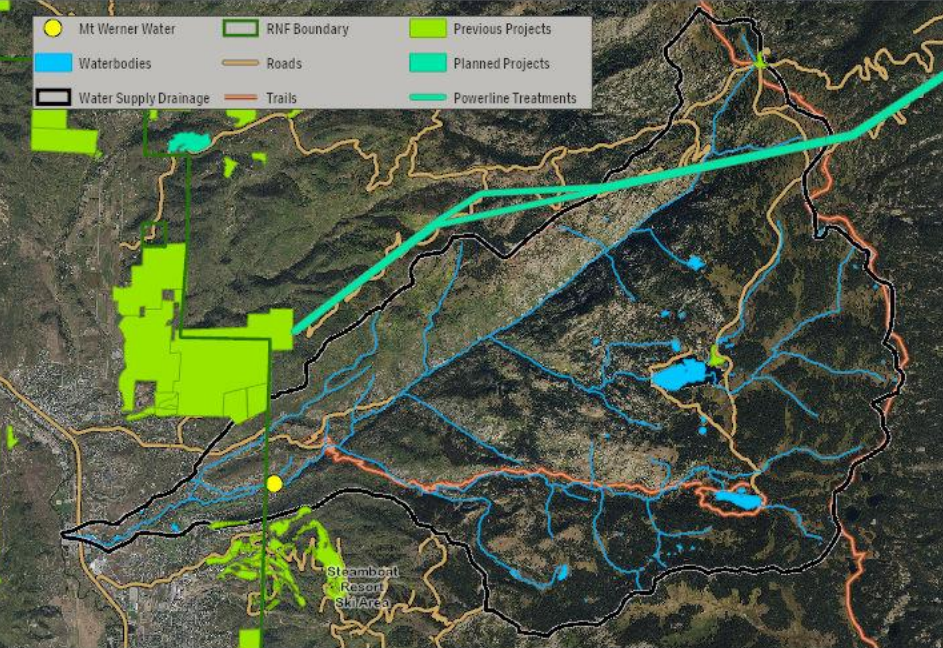
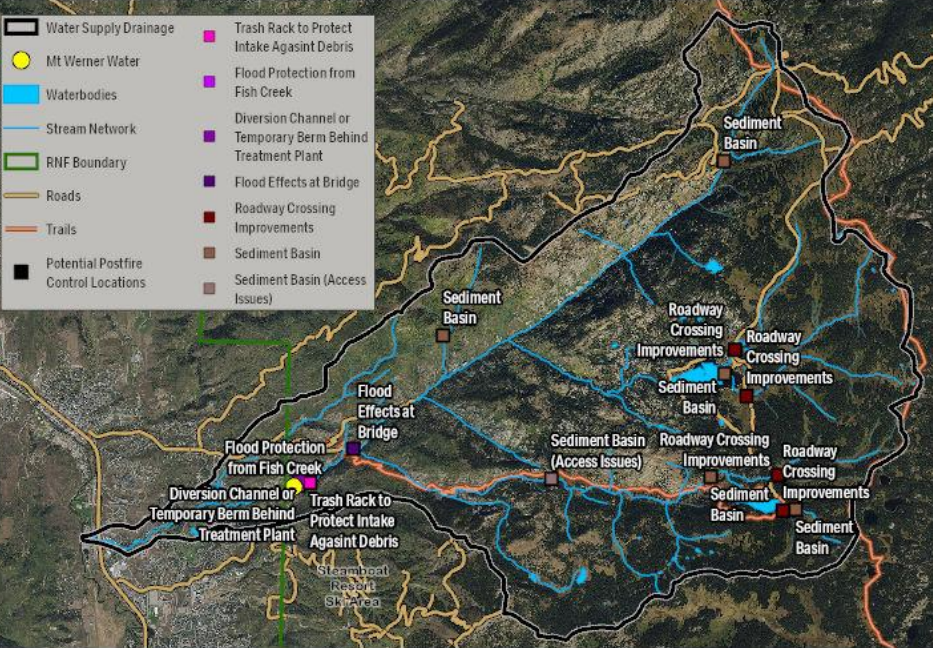
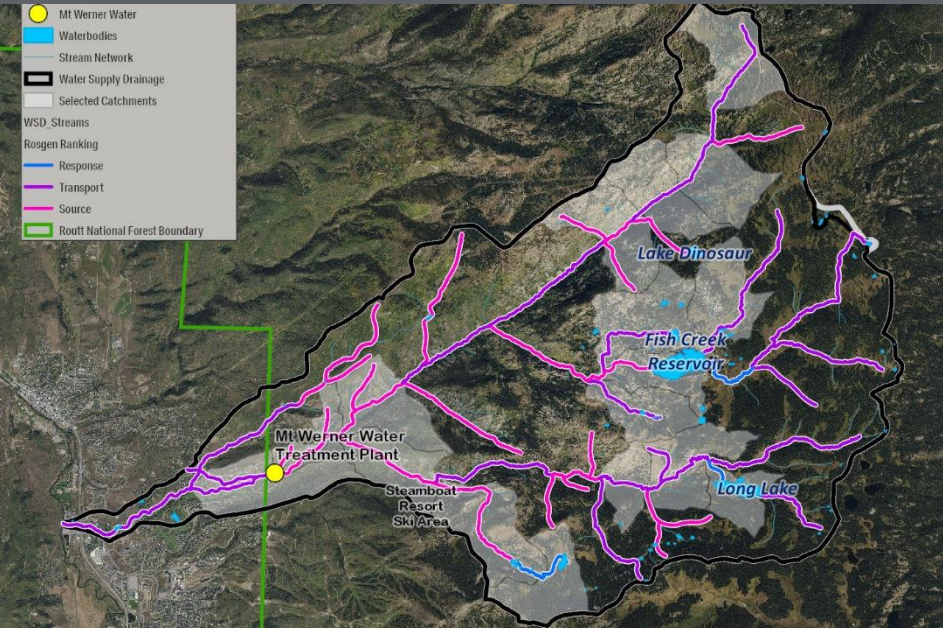
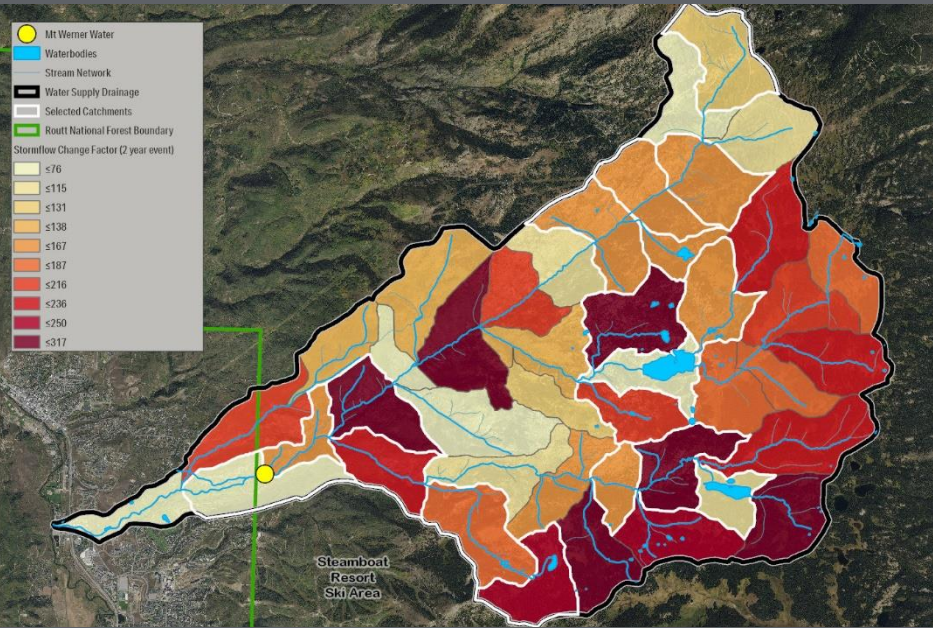


Highest hazard areas shown in red



Areas most sensitive to burn severity shown in red

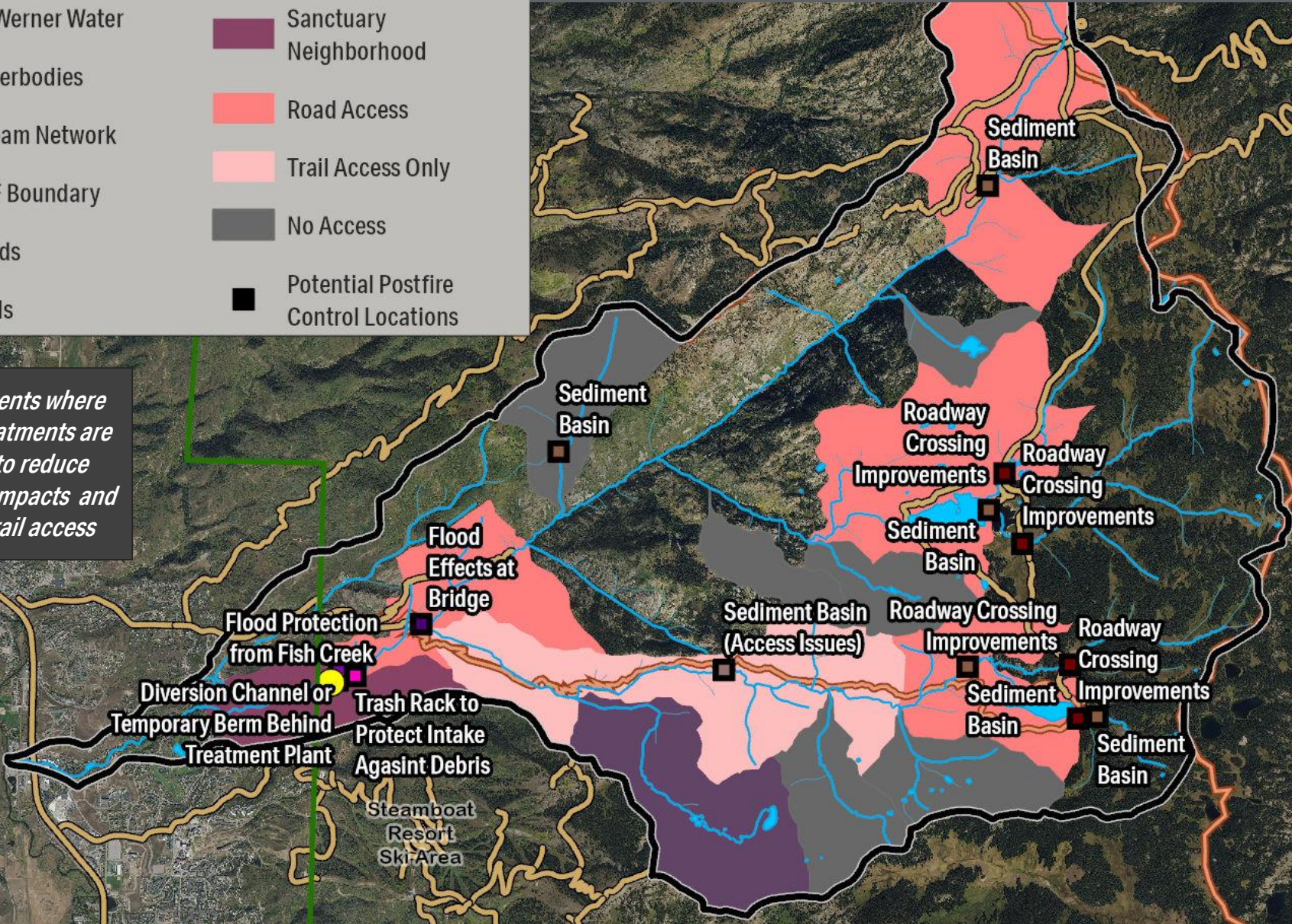
PROJECT IDENTIFICATION AND PRIORITIZATION



PROJECT IDENTIFICATION AND PRIORITIZATION



Catchments where fuels treatments are likely to reduce postfire impacts and road/trail access



FINAL PRIORITIZED MAP



WATER COLLECTION & TREATMENT

› Sediment

- / 2-3 orders of magnitude increase in TSS; along with particulate-bound contaminant increase (i.e. metals, TOC, TP)
- / ~ 1 order of magnitude turbidity increase
- / Primarily transported in stormflow, but increased concentrations observed during melt following Hayman Fire

› Organic Carbon

- / ~1 order of magnitude increase

› Nutrients

- / ~1 order of magnitude increase
- / Can lead to algal growth in reservoirs

› Metals

- / 2-3 order of magnitude increase in unfiltered samples (sediment-bound, so can often be addressed with filtration)

› pH, Alkalinity

- / Both increase due to dissolution of ash and leaching of cations from ash burned litter



WATER COLLECTION & TREATMENT

› Sediment

- / Decreased reservoir capacity
- / Overwhelm filtration system
- / Shutdown intakes

› Organic Carbon

- / Disinfectant byproducts

› Nutrients

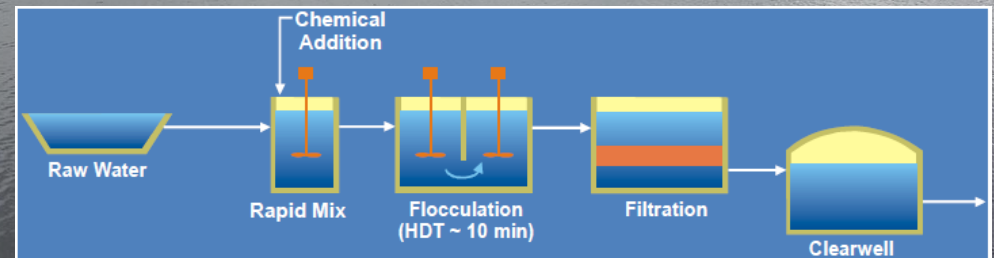
- / Increased algal growth can lead to unwanted tastes and odors
- / Ammonia can interfere with chlorination

› Metals

- / Concentrations likely to exceed health standards during storm events
- / Iron and manganese can interfere with chlorination

› pH, Alkalinity

- / Impacts chemistry of treatment process



IMPLEMENTATION STRATEGY & ACTION PLAN

| Project/ Action Item | Description | Cost / Time Estimate |
|--|---|---|
| A more wildfire resilient landscape in the watershed | | |
| Treatment Plant Protection | Create defensible space using Zone concept. | \$1,000-2,000/ acre |
| Previous CWPP Projects | Evaluate/ complete Sanctuary and Burgess Creek CWPP recommendations | \$3,000-5,000/ acre |
| Roads, Trails, Campgrounds | Work with USFS to evaluate/ maintain fuels treatments in high use areas. | \$3,000-5,000/ acre |
| Riparian Corridors | Assess, monitor, and maintain wetlands and riparian corridors in the upper watershed. | work with USFS |
| Upland Forests | Assess/ monitor upland forest condition; reconstruct basin fire history; monitor ASCC/ CSFS study. | work with CSFS |
| Timely and effective implementation of postfire hydrologic/ sediment controls in the watershed if a fire occurs | | |
| Rain Gauge Installation | Partner with NWS to install a rain gauge in the upper watershed. | \$1,500-4,000 |
| BAER Support | BAER rapidly evaluates the burned area and prescribe emergency stabilization treatments; Steamboat can support BAER by having local suppliers of erosion control materials (wood straw, wood shred), and providing the (CWP)2 data package. | USFS funded, FEMA, and NRCS programs fund projects on private lands |
| Infrastructure Protection | Temporary diversion/berm at FCFP, sediment basins, road crossing improvements. | \$9,000-\$200,000 |
| Community and guests that are educated about their drinking water source, the threat of wildfire, and responsible use | | |
| Informational Campaign & Volunteer Days | Place informational signs in high-use areas, notices on trail web map interfaces and in hotels/resorts. Partner with Yampatika and YVSC on watershed walks and volunteer days. | \$50,000 |
| Coordinated preemptive mitigation, wildfire response, postfire emergency stabilization, and recovery/ restoration | | |
| Routt County Wildfire Council | Integration point for (CWP)2, with the City's Water Resource Mgr. and District's GM representing the watershed/ supply. | 40-80 hours |
| Permitting Collaboration | Identify NEPA and HFRA requirements for projects in RNF. Secure WUI designation for Fish Creek basin. | 20-60 hours |
| Funding Investigation | Work with partners to ensure eligibility requirements for key preemptive watershed wildfire protection and postfire watershed restoration grant programs are met. | 20-60 hours |
| Water supply system resiliency | | |
| Water Supply System Improvements | Complete near-term action items: intake protection (\$30-300k), residuals management (\$5k-TBD), testing equipment (\$40-60k), filter improvements (<\$1,000-\$350,000), mobile treatment/ dewatering (TBD, establish MSA). | |
| | Plan for mid-size improvements: intake hydrocyclone (TBD), cationic polymer feed (\$50-150k), non-ionic polymer feed (\$50-150k), bulk alum tanks (\$200-500k). | |
| | Evaluate and determine course of action for large-scale, long-range improvements: pre-treatment (\$100k-\$5M), post-filtration (\$4-10M), capacity expansion | |

IMPLEMENTATION STRATEGY & ACTION PLAN

| Project/ Action Item | Description | Cost / Time Estimate |
|----------------------|-------------|----------------------|
|----------------------|-------------|----------------------|

A more wildfire resilient landscape in the watershed



IMPLEMENTATION STRATEGY & ACTION PLAN

| Project/ Action Item | Description | Cost / Time Estimate |
|----------------------|-------------|----------------------|
|----------------------|-------------|----------------------|

Timely and effective implementation of postfire hydrologic/ sediment controls if fire occurs




IMPLEMENTATION STRATEGY & ACTION PLAN

| Project/ Action Item | Description | Cost / Time Estimate |
|----------------------|-------------|----------------------|
|----------------------|-------------|----------------------|

Responsible community /guests that are educated about wildfire threats to their drinking water

A Waste-Free Legacy




Exploring Waste-less opportunities.

GO AHEAD AND DRINK FROM THE TAP! IT IS GOOD AND IT IS FREE! Lets stay hydrated and reduce our plastic waste. Grab a glass or refill your water bottle and take a sip! Staying hydrated has never been so easy. This water is safe for drinking.

Our provider, Steamboat Springs City adheres to the Colorado Department of Public Health and Environment to provide an annual Water Assessment Report ensuring all water quality standards are being met.

To locate safe tap water when away from your room download the 'Drink From Tap' app.

YOU CAN DO IT!



DRINK THAT WATER

City of Steamboat Springs

1% FOR THE PLANET

CLEAN WATER STARTS WITH YOU

When you look at Silver Lake, what do you see?
 Is the water clear or covered with algae?
 If you stomp, will deep in the water would you see fish in your pool?



What You Can Do:
 • Don't dump chemicals in lakes and rivers
 • Use a water filter with a lead and copper test
 • Use a water filter with a lead and copper test
 • Use a water filter with a lead and copper test
 • Use a water filter with a lead and copper test



Trails

City of Steamboat Springs

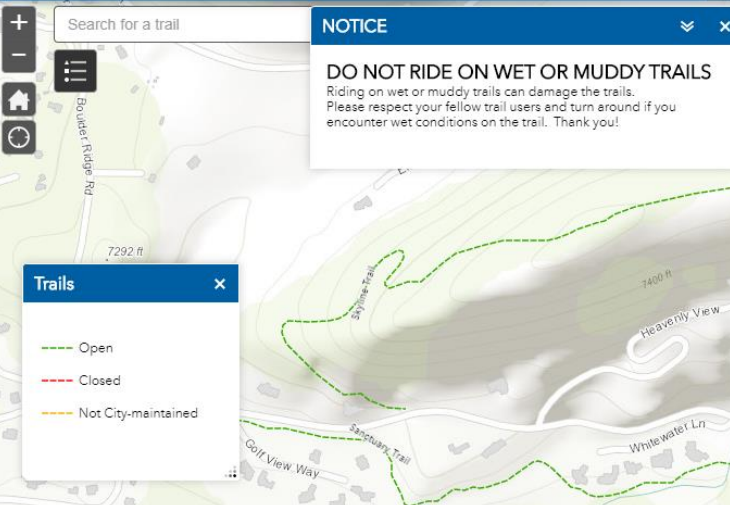
Search for a trail

NOTICE

DO NOT RIDE ON WET OR MUDDY TRAILS
 Riding on wet or muddy trails can damage the trails. Please respect your fellow trail users and turn around if you encounter wet conditions on the trail. Thank you!

Trails

- Open
- Closed
- Not City-maintained



IMPLEMENTATION STRATEGY & ACTION PLAN

| Project/ Action Item | Description | Cost / Time Estimate |
|----------------------|-------------|----------------------|
|----------------------|-------------|----------------------|

Coordinated wildfire mitigation, response, postfire emergency stabilization, and restoration



MAY
10

Rout County Wildfire Mitigation and Planning Roundtable


by Wildfire Mitigation Conference Steering Committee

[Follow](#)

Free




Rout County Community Wildfire Protection Plan



September 2010

Forest Management to Protect Colorado's Water Resources




A Synthesis Report to Support House Bill 16-1255
June 2017

CO WY COLORADO
Colorado Water
Governance Board

WATER RESOURCES
INSTITUTE

Nah B. H. Youakim, Ryan Lockwood,
Joseph O'Brien, Joseph Duda,
Chuck Skowden, Lisa Mason

Upper Yampa River Watershed Plan




Protecting and Managing Long Term Health


A Collaboration of the Upper Yampa Technical Committee, Watershed Group and Commitments

Lead Author: Lynn Halliday, Environmental Solutions: Cahd, LLC
Steamboat Springs, Colorado

Upper Yampa River Watershed Plan Executive Summary May 2010




STEAMBOAT SKI RESORT DRAFT ENVIRONMENTAL IMPACT STATEMENT



JANUARY 2018

USDA Forest Service
Medicine Bow-Rout National Forest
and Thunder Basin National Grassland
Hahn's Peak/Bears Ears Ranger District



United States Department of Agriculture
Forest Service


Buffalo Pass Trails Project

Environmental Assessment & Finding of No Significant Impact

Hahn's Peak/Bears Ears Ranger District, Medicine Bow-Rout National Forest and Thunder Basin National Grassland, Rout County, Colorado

Township 6 North, Range 83 West, Sections 3-5, and 8; Range 84 West, Sections 1, 2, and 11; Township 7 North, Range 83 West, Sections 27-29 and 32-35; Range 84 West, Sections 25-28 and 35-36.

May 2016
Responsible Official: Chad Stewart, District Ranger
For further information contact: Kent Foster, Recreation Program Manager, (970) 870-2142, kfoster@fs.fed.us



Mountain biking on Buffalo Pass.

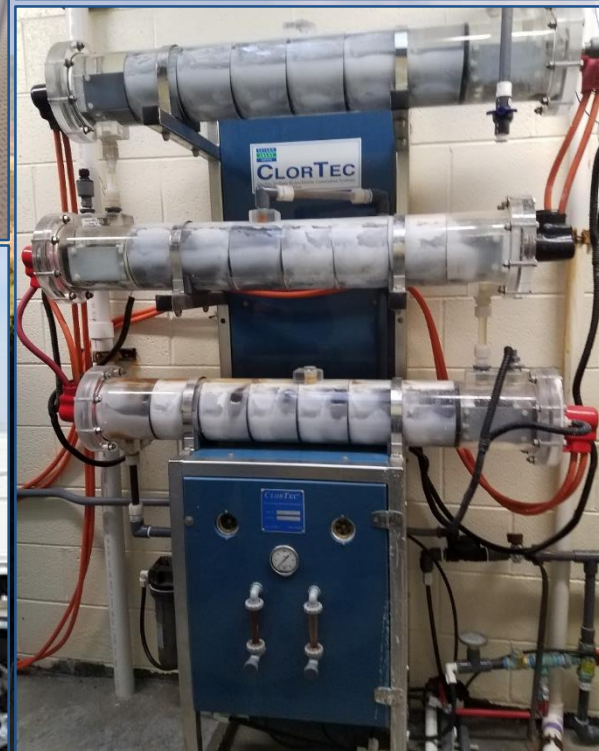
IMPLEMENTATION STRATEGY & ACTION PLAN

Project/ Action Item

Description

Cost / Time Estimate

Water supply system resiliency



THANK YOU



kromeroheaney@steamboatsprings.net

970.871.8205

megan.burke@respec.com

406.204.0829
