

Fire Risk to Water Supplies Assessment

A Partnership Pursuing the Protection of Community Resources

The Goal of the Fire Risk to Water Supplies Assessment is to determine watershed priorities for forest restoration in order to protect water supply resources and facilities most at risk to wildfire, and build support for watershed protection through forest restoration activities.

Project Summary

Partners involved in the San Juan Headwaters Forest Health Partnership recognized that forest health issues were directly related to the vitality and resilience of local communities. Wildfire impacts lives, property, local economies, and community well-being. It can directly impact water quality and availability in the short- and long-term. The threat to water is mostly related to erosion associated with loss of vegetative cover resulting in sediment settling in water transport and storage facilities. Many communities throughout the west have experienced very high costs for dealing with post-fire damage to water systems in recent years. Investing in pre-fire mitigation measures is increasingly being considered a smart investment.

The geographic area included in the assessment is the lands contained within the outer boundary of the Pagosa Ranger District of the San Juan National Forest in southwestern Colorado. This is roughly takes in the headwaters of the San Juan River. It addresses mixed conifer and ponderosa pine forested lands surrounding Pagosa Springs, Colorado and the forested watersheds that are experiencing elevated wildfire risk.

The assessment is designed to support existing planning efforts that have taken place in the region. Archuleta County has developed a County Community Wildfire Protection Plan. Several subdivisions are actively developing site-specific CWPPs. The information presented in the assessment is timely and needed for updating CWPPs and developed to be considered in concert with efforts on public and private lands. The assessment *identified five high value/high risk focus areas in which forest treatments have the opportunity to be effective at protecting community water resources.*

Process Overview

- Map water infrastructure
- Describe likelihood of fires occurring
- Describe potential risk to water resources from fire
- Identify subset of larger area that has high values and high fire risk for further focus
- Identify high-priority areas to focus future management actions

Water Infrastructure was mapped by the USFS hydrologist using data from the State Water Engineer, USFS, and Pagosa Area Water and Sanitation. See map on last page.

Likelihood of Fires Occuring was studied by examining where fires had started on the Pagosa Ranger District between 1970 and 2013 to look for patterns. Assessments in some others parts of Colorado where many of the ignitions are human-caused have found this useful. A map of that data is available upon request. Most wildfires in this area are caused by lightning. Ignitions were fairly evenly distributed across the Ranger District during the 43-year period, so trying to predict where fires were most likely to start wasn't deemed helpful here.

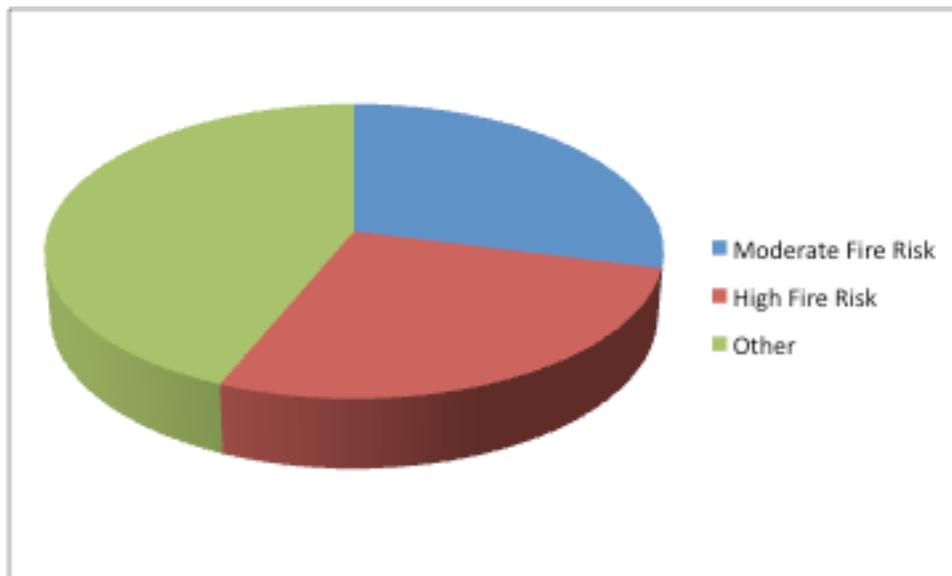
Potential Risk to Water Resources from Fire was considered to be a function of vegetation conditions and slope plus proximity to water infrastructure. The highest fire risk is found on steep slopes in two different vegetation situations: 1) vegetation types, usually ponderosa pine or warm-dry mixed-conifer found at relatively lower elevations, that historically had frequent fires but haven't in the last 100 years or so (fire regime condition class 3 in technical jargon) and 2) cool-moist mixed-conifer or spruce-fir, typically found at higher elevations (these aren't out of sync with historical fire regimes but are where high-intensity fires have occurred in the area in recent years). Areas with the same vegetation conditions but on less steep (less than or equal to 35%) slopes were considered to be at moderate risk. See map on last page.

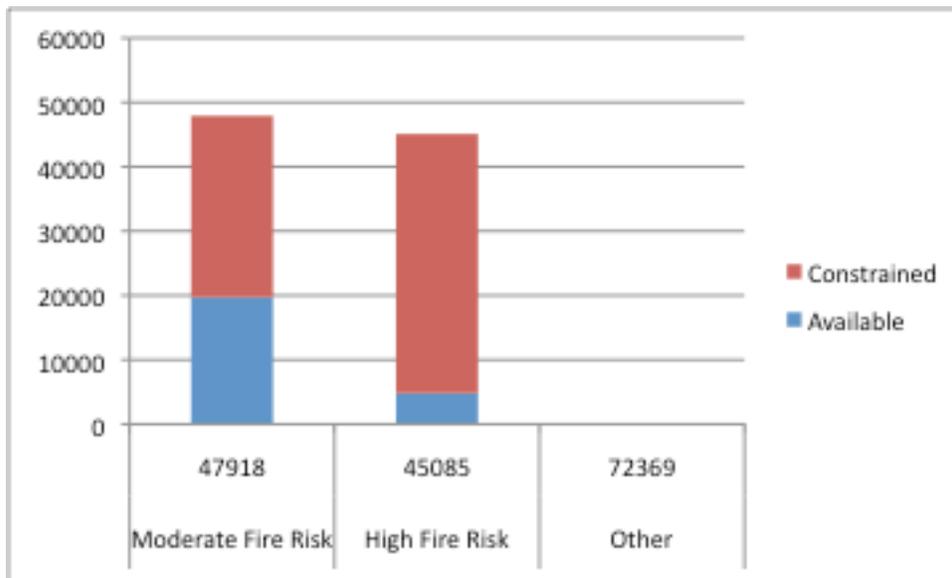
A Subset of Larger Area that has both High Values for Water Supplies and High Fire Risk was identified by the assessment team. Five focus areas, shown in the map on the last page, were identified: Fourmile, Turkey Creek, PAWSD West Fork Diversion, Upper Rio Blanco, and Lower Rio Blanco. These areas should receive special consideration for fuels reduction or other projects that help mitigate fire risk to water resources. The three northern areas include water diversion, transfer, storage, and treatment facilities for the Pagosa Area Water and Sanitation District. The two southern areas include many shallow wells that serve subdivisions and a diversion and pipeline that transfers water to the Chama and Rio Grande Rivers to serve New Mexico. All include diversions and ditches that serve agricultural water uses.

For the focus areas, potential types of projects to reduce risk and constraints that limit options were examined. Types of projects considered included: 1) managed wildfire, 2) prescribed fire, 3) mastication (cutting but leaving the material in place), 4) traditional logging (cutting and removing larger material, leaving or pile burying smaller material), and 5) whole tree logging and biomass removal (cutting and removing almost all of the cut material). Some constraints on these types of projects are too site-specific to be considered in this assessment but others, such as legal restrictions related to designations such as wilderness, wild and scenic rivers, research natural areas (RNAs), and Colorado roadless areas were examined.

Constraint analysis for the five focus areas combined:

- 184,511 acres total in the five areas
- 165,272 acres of that are national forest system lands
- 45,085 acres of national forest is high fire risk
- 16,878 acres of high risk is outside of wilderness, RNAs and wild rivers
- 4,789 acres of that is also outside of roadless
- 47,918 acres of national forest is moderate fire risk
- 32,174 acres of moderate risk is outside of wilderness, RNAs and wild rivers
- 19,721 acres of that is also outside of roadless





As the graphs illustrate, most of the acres of high and moderate fire risk have constraints limiting mechanical treatment. However some of the areas available are near water facilities and could have meaningful effects on reducing fire risk. When combined with prescribed fire, mechanical treatments can increase the opportunity to respond to wildfires in ways that both reduce risk to high-value resources and do ecological good.

High-priority areas to focus future management actions were identified by the assessment team. Areas within the five focus areas that were near national forest lands already treated, planned or active private land treatments, and with some planning and National Environmental Policy Act (NEPA) analysis completed were given priority. See map on last page. This is considered an on-going process. Suggestions for improvement and new opportunities are encouraged.

Project Partners:

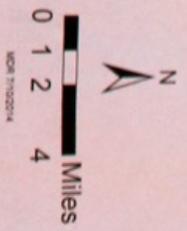
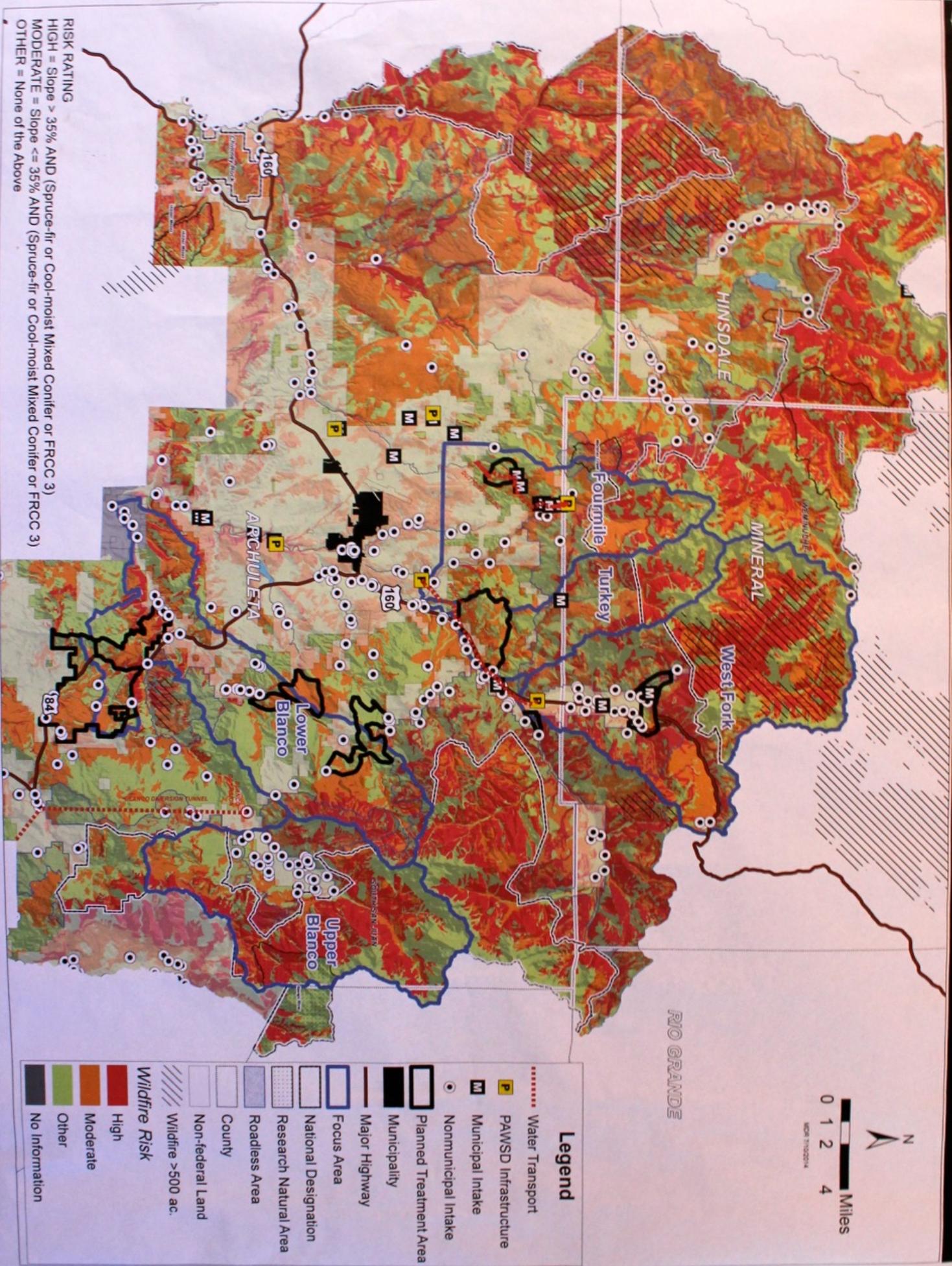
Archuleta County
 Backcountry Horsemen
 Colorado State Forest Service
 FireWise of Southwest Colorado
 Forest Health Company
 Local Landowners

Mountain Studies Institute
 Natural Resources Conservation Services
 Pagosa Area and Water Sanitation District
 Ranchers
 San Juan Headwaters Forest Health Partnership
 USFS San Juan National Forest

For more information, contact Aaron Kimple, akimple@mountainstudies.org, 970-387-5161



Fire Risk to Watershed Project - Watershed Risk Assessment - Pagosa Ranger District, San Juan NF



Legend

- Water Transport
- PAWSD Infrastructure
- Municipal Intake
- Nonmunicipal Intake
- Planned Treatment Area
- Municipality
- Major Highway
- Focus Area
- National Designation
- Research Natural Area
- Roadless Area
- Non-federal Land
- Wildfire >500 ac.
- Wildfire Risk High
- Wildfire Risk Moderate
- Wildfire Risk Other
- No Information

RISK RATING

HIGH = Slope > 35% AND (Spruce-fir or Cool-moist Mixed Conifer or FRCC 3)
 MODERATE = Slope <= 35% AND (Spruce-fir or Cool-moist Mixed Conifer or FRCC 3)
 OTHER = None of the Above