



# Prioritizing Vegetation Management with the From Forests to Faucets Partnership

## What is the From Forests to Faucets Partnership and why does it matter?

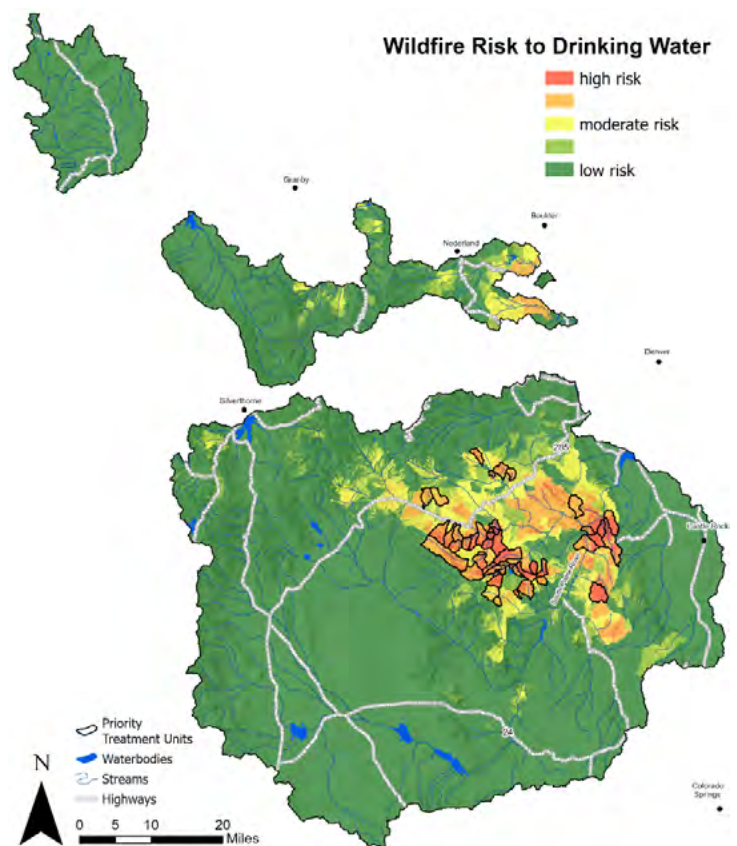
- In the aftermath of the 1996 Buffalo Creek and 2002 Hayman wildfires, Denver Water spent over **\$27.7 million** on water quality treatment, sediment and debris removal, and remediation to the collection system and is still investing in post-fire recovery more than two decades later.
- In 2010, Denver Water formed the From Forests to Faucets Partnership (F2F) to **proactively address watershed related wildfire risks with land and fire management agencies**. Denver Water only owns 2% of the land within the collection system and has no authority for fire management, making collaboration essential to achieve drinking water protection goals. The shared objectives of improving forest resilience and reducing risk of severe wildfire impacts to drinking water support collective action between F2F partners: Denver Water, the USDA Forest Service, the Colorado State Forest Service, the Natural Resources Conservation Service, and the Colorado Forest Restoration Institute.
- F2F partners cannot feasibly reduce wildfire risk across all 2.5 million acres of Denver Water's collection system, so partners co-developed a wildfire risk assessment (Rhea et al., 2024) to **identify where vegetation management can build wildfire resilience into source water supply**.

## 1) Collaborative planning led to increased return on investment

- The F2F partnership is stronger because of adaptive management. When a return-on-investment analysis (Jones et al., 2021) found that **improving spatial prioritization of fuels reduction would increase the economic benefits** of source water protection, the partnership used that information to proactively prioritize vegetation management in the most impactful areas and increase program effectiveness.
- Fuels reduction treatments can have benefits beyond drinking water protection such as protecting public safety and built infrastructure, while enhancing wildlife habitat, ecological restoration, and recreation resources. The F2F partnership's public and private partners can **invest where values overlap** to improve return on investment for mutual benefit.

## What is risk?

*In this assessment, "risk" means the likely impact of post-fire erosion, debris flows, and sediment delivery to drinking water infrastructure (reservoirs, diversions, and pipelines) and is weighted by infrastructure relative importance.*



This collaboratively developed, science-based assessment combines ecological processes and economic impacts to characterize wildfire risk to drinking water (green to red colors) and maximize risk reduction per dollar spent of future vegetation management actions (black outlines).

## 2) Wildfire risk to drinking water is concentrated in the montane zone of the Upper South Platte watershed

- Forests prone to **burning at high severity on steep hillslopes** with **high connectivity to water infrastructure** pose the greatest risk to drinking water within Denver Water's collection system
- 80% of Denver Water's supply flows through Strontia Springs Reservoir, making it the most sensitive piece of water infrastructure to post-fire sedimentation and

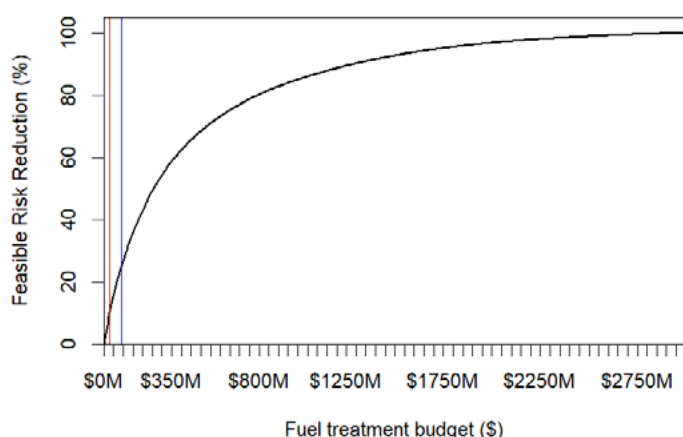
storage loss. Strontia Springs is located in the montane zone of the Upper South Platte watershed.

- Burn probability is the highest in the montane zone.
- There are two primary strategies for reducing wildfire risk to drinking water - 1) **reduce fire intensity on hillslopes contributing to or upstream of critical water infrastructure** and 2) **limit the spread of undesirable fire into fire-sensitive watersheds**. This analysis identified priority actions to support both strategies.

### 3) Low- to moderate-intensity fire is the most cost-effective strategy to reduce risk to drinking water in the montane zone

- While large areas of high severity wildfire can negatively impact source water quality, **low- to moderate-severity prescribed and wildland fire is the most cost-effective tool for long-term source water protection**.
- Reducing both tree density and surface fuels is the most effective treatment method for reducing risk by promoting low- to moderate-severity fire, but can be expensive.
- Thinning-only treatments that do not reduce surface fuels are less effective at reducing risk, but can be more effective than the no action alternative.
- The partnership will **strategically target vegetation management in the highest-risk area** upstream of the Strontia Springs Reservoir in the Upper South Platte watershed, but will continue partnering with agencies implementing proactive vegetation management throughout Denver Water's collection system.

Risk Reduction by Budget



Risk reduction curve across a variety of simulated budgets. The vertical red and blue lines denote the \$30M and \$90M budgets, respectively. This curve was developed for the uncapped treatment scenario.

### 4) Diverse management actions will be required to address climate-driven increases in wildfire risk

- This analysis identified the most cost-effective locations where vegetation management can reduce wildfire risk to drinking water. However, vegetation management can't eliminate all wildfire risk in a given location and wildfire risk still exists beyond the priority treatment units identified in this analysis.
- The F2F partnership can **plan for and address the remaining risk** with diverse management actions before, during, and after a fire:
  - Directly address high risk areas with **local fuels reduction, floodplain enhancement, sediment reduction structures, and aerial mulching**.
  - Reduce the risk of wildfire spreading into high-risk areas by **improving potential containment lines (e.g., pre-identified POD boundaries), reducing human ignitions, fire patrols, and recreation planning**.
- The **greatest climate warming-driven increases in risk to water supplies are in the montane zone** (ponderosa pine and Douglas-fir), where hazardous fuel conditions and high burn probability intersect with critical water infrastructure that is particularly sensitive to post-fire impacts. However, climate warming may disproportionately increase extreme fire behavior and burn probability in sub-alpine forest types dominated by lodgepole pine, Englemann spruce, and subalpine fir, which is already being observed in the Rocky Mountain Region.

#### Additional Resources:

- Davis KT, Peeler J, Fargione J, Haugo RD, Metlen KL, Robles MD, and Woolley T (2024) Tamm review: A meta-analysis of thinning, prescribed fire, and wildfire effects on subsequent wildfire severity in conifer dominated forests of the Western US. *Forest Ecology and Management*. 561. <https://doi.org/10.1016/j.foreco.2024.121885>.
- Jones KW, Gannon B, Timberlake T, Chamberlain JL, and Wolk B (2022) Societal benefits from wildfire mitigation activities through payments for watershed services: Insights from Colorado. *Forest Policy and Economics*. 135. <https://doi.org/10.1016/j.forpol.2021.102661>.

#### To Read the Full Technical Report:

Rhea A, Wolk B, Ritter S, and McDonald M (2024) From Forests to Faucets Partnership Wildfire Risk Assessment. CFRI-2414. [https://cfri.colostate.edu/wp-content/uploads/sites/22/2024/09/Rhea\\_et\\_al\\_FromForestsToFaucetsPartnership\\_WildfireRiskAssessment CFRI 2414.pdf](https://cfri.colostate.edu/wp-content/uploads/sites/22/2024/09/Rhea_et_al_FromForestsToFaucetsPartnership_WildfireRiskAssessment_CFRI_2414.pdf)

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