TREASURED LANDSCAPES, UNFORGETTABLE EXPERIENCES

Hayman Restoration Partnership
Post-Fire Restoration of the Hayman Fire Burn Area
Pike National Forest, Colorado

2009-2014
Final Site Report
Partners


Supporters

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Treasured Landscapes, Unforgettable Experiences • • •

The National Forest Foundation (NFF) launched the Treasured Landscapes, Unforgettable Experiences conservation campaign to address critical forest and watershed restoration needs across millions of acres nationwide – focusing on iconic places that resonate with the American public. Our goals are to:

- Raise awareness about America’s public lands and our unique National Forest System – and reconnect our people to these great places.
- Generate expanded media attention, public interest, and partnerships in the Treasured Landscapes campaign.
- Grow a strong base of supporters to ensure successful restoration projects at a suite of 14 or more campaign sites across the nation.

A portion of the Hayman Fire burn area on the Pike National Forest, in Colorado’s Front Range is a designated Treasured Landscapes campaign site.

Site Overview • • •

The Hayman Fire
In June of 2002, the perfect conditions for a devastating fire converged in the forests near Denver, Colorado. A five-year period of below-normal precipitation exacerbated by unseasonably dry air, gusty winds, and decades of fire suppression created conditions ripe for a wildfire. These conditions and human carelessness created what was, at the time, Colorado’s largest and most impactful fire.

For twenty days, the Hayman Fire raged through the Pike National Forest, as well as state, county and private lands, burning a total of 137,760 acres. The fire consumed 600 structures, including 133 homes, jeopardized habitat for numerous threatened or endangered species, damaged trails and roads, and severely impacted the water source for more than 75% of Colorado’s 4.3 million residents and states downstream.

A Damaged Ecosystem
The Hayman Fire was unnaturally severe. In many areas, the trees that typically provide the seed source for natural regeneration after wildfires were scorched. Instead of stimulating growth in a post-fire environment, the high-intensity fire obliterated the native flora, created an opportunity for non-native invasive species to take root, and left behind disturbed soil and a highly erosive landscape. Erosion is especially problematic in this area since it leads to increased sediment being washed into the valuable South Platte River. This increase in sediment negatively impacts fish and wildlife habitat, streamflow, watershed health, reservoir storage capacity and the quality and cost of Colorado residents’ water supply.
Following the fire, natural recovery occurred across many acres. Early tree planting and grass seeding efforts proved successful in areas severely affected. However, several drainages within the South Platte River watershed remained in significant need for restoration. The Trail Creek watershed, a critical sub-watershed of the Upper South Platte River, represented the highest priority for addressing sediment issues.

**Restoring a Treasured Landscape**

While the problems facing the Trail Creek and its watershed were clear, the solutions needed to restore them were not. Working collaboratively with the Forest Service and local partners, the NFF developed specific goals for the restoration of the Trail Creek watershed and surrounding forests and then worked with a diverse group of partners and supporters to accomplish these mutually-developed goals. Work across the project area included a variety of activities that were all designed to restore degraded perennial streams and ephemeral stream channels, improve aquatic and terrestrial habitats, and reduce erosion and downstream sediment flow. Hand crews and volunteers worked across the project area, seeding and planting native vegetation, repairing ephemeral headcuts, conducting trail and road work, building fences, reducing fuel loads, and treating invasive species. At 17 individual sites within the Hayman burn scar, heavy equipment was used to conduct more intensive stream restoration and sediment control activities.

This initiative provided an opportunity for partners (land management agencies and local nonprofits) to increase their internal capacity for planning and implementing large-scale, post-fire watershed restoration work. The Trail Creek restoration site has served as a model for student hydrologists and for government agencies and water providers involved with post-fire restoration work across the West. In fact, partner capacity and lessons learned from this project were recently employed as land managers worked to restore the landscape damaged by the nearby Waldo Canyon and West Fork Fires. This increased knowledge and capacity will be more and more important as Colorado’s steep landscapes continue to burn in unnaturally severe wildfires.

**In bringing the Trail Creek and South Platte River watersheds to a healthier state, the NFF has benefitted Colorado’s wildlife, local communities, and the millions of people that depend on the South Platte River’s clean, reliable water.**
Location Map • • •
Restoration in Practice • • •

With clear ecological and human needs, the NFF worked with old and new funders to raise the money needed to implement the myriad restoration projects. With instrumental leadership support from Vail Resorts, the NFF was able to garner additional support from other corporate interests, such as Coca-Cola; dependent water utilities, such as Aurora Water; and philanthropic giving from foundations, such as the Gates Family Foundation, and quickly acquired the money needed to begin on-the-ground restoration projects.

The NFF’s focus on building local capacity and a lasting constituency of supporters were keys to our successful restoration efforts. By providing grants to local conservation organizations and local contractors, we invested in the local community, built the skills and knowledge of local groups, and supported the regional economy.

The work on the Hayman Restoration Project would not have occurred without collaboration between and support from many valuable partners. The actual on-the-ground work was performed by seven different contractors, field crews from local nonprofit stewardship groups – Coalition for the Upper South Platte, Rocky Mountain Field Institute, the Mile High Youth Corp, and an AmeriCorps National Civilian Community Corps (NCCC) crew – and hundreds of other volunteers. In total, we estimate that approximately 2,739 volunteers contributed 22,422 hours to accomplish the on-the-ground work.

Many of the volunteers that worked on this project were recruited by local nonprofit stewardship groups. These engagement opportunities expanded volunteer rosters and enhanced the community relationships of our nonprofit partners. Indeed, many of the same volunteers that helped restore the Hayman Fire burn scar are still volunteering with our local nonprofit partners on other forest restoration projects.

Project Accomplishments

Our collaborative efforts resulted in a set of three high-level project goals:

1. Erosion Control
2. Revegetation of Denuded Soils
3. Stream Channel Reestablishment

Together with our partners, we implemented projects that accomplished each of these goals.
Stream Reconstruction and Restoration

**Stream Design and Reconstruction:** Five reaches of perennial streams and twelve ephemeral channels were completely reconstructed by reestablishing a defined channel, hardening or armoring stream edges, and creating instream structures. Additionally, numerous segments of perennial stream channels and ephemeral channels were restored to reduce sediment transport and improve aquatic habitat conditions in the Trail Creek and West Creek watersheds. In total, four miles of stream were restored.

**In-stream Structures:** Large logs and boulders for the project were sourced from nearby sites on the National Forest to create in-stream structures. Over 3,000 pieces of large wood and approximately 2,000 yards of granite boulders were used to construct 511 structures within the project area. Structures included “Rock & Roll” log vanes, J-hook vanes, cross vanes, boulder and/or wood drop structures, log sills, toe wood pool features & riparian benches.

**Stream-Road Crossings:** Seven stream-road crossings were eliminated in the project area and nine culverts or crossings were repaired or improved, including the critical culvert crossing Trail Creek at Douglas County Road 73, which was completely reconstructed. The old culvert system was incapable of handling the increased runoff coming off the burn scar, which led to clogged culverts and flooding of nearby residences.
Off-Channel Ponds

In the process of realigning several of the perennial stream channels, seven off-channel ponds were constructed to provide fill material necessary for the project. The ponds, connected by small tributary channels to the main stem of the creeks, provide additional habitat and rearing areas for resident brown and brook trout.

Erosion Control and Sediment Catchments

Twenty one sediment retention basins were constructed in eleven sub-basins of Trail Creek and West Creek to reduce sediment input into the perennial channel, and nine alluvial fans were restored to their proper function. Additionally, 748 headcut control structures were installed to reduce erosion in ephemeral drainages. The highly erosive soils in this area – primarily Pikes Peak Granite – made erosion control a significant challenge, but vitally important.

Trail and Road Work

Numerous user-created trails and roads throughout the West Creek and Trail Creek watershed were major sources of erosion and served as conduits for sediment transport into Trail Creek following the Hayman Fire. Working with volunteers, local partners, and youth corps, we repaired, restored, or decommissioned 75 miles of trail and four miles of roads.
Vegetation Management

**Tree Planting:** With the loss of seed sources across much of the burn scar and the incineration of much of the existing seed bank, it was necessary to plant ponderosa pines in the most severely burned areas. Additionally, willow cuttings were planted in newly established riparian areas to reduce sedimentation, increase stream bank stability, and provide important riparian habitat. Many newly established planted riparian areas were fenced off to reduce impacts from camping and OHV use. In total, with volunteers and Forest Service employees, we planted 56,000 trees and shrubs in the West Creek watershed and constructed over four miles of fencing.

**Invasive Plant Control:** With volunteers, local groups, and youth crews, we removed invasive plants from nearly 90 acres within the Trail Creek and West Creek watersheds to protect and restore native plant communities.
Project Spotlight: Trout and Beaver Return to Trail Creek

Monsoon rains following the Hayman Fire caused significant flooding and erosion events that decimated Trail Creek. Portions of the stream channel were destroyed, culverts at road crossings were blocked and overtopped, and the Creek’s trout population above West Creek Reservoir was eliminated.

For decades, this tributary to West Creek, and eventually the South Platte River, had provided important spawning and rearing habitat for brook trout and brown trout. Fishermen regularly fished its waters and also depended on the Creek to produce trout for downstream fisheries.

The NFF and the Forest Service aimed to restore Trail Creek, creating habitat that could support the eventual reintroduction of trout to its water.

Within two years of completing stream reconstruction activities on Trail Creek, trout naturally returned! Three years later, beavers returned!

Trail Creek is once again providing valuable stream and riparian habitat. Visitors can once again camp and hike alongside a healthy, natural stream.
Engaging the Community and Increasing Public Awareness • • •

The NFF emphasizes public engagement in all of its projects. Working with our local partners, we regularly engaged volunteers in hands-on restoration work, including five Friends of the Forest® Day volunteer events. Beyond the on-the-ground restoration work with volunteers, the NFF engaged researchers, land managers, and nonprofit organizations in a Hayman Fire Science Symposium, addressing lessons learned after ten years of recovery, rehabilitation, and restoration.

Friends of the Forest Days

The NFF’s signature Friends of the Forest Day volunteer program, offered a way for the public to get involved and learn about their local Treasured Landscapes, Unforgettable Experiences site on the Pike National Forest. Volunteers from Coca-Cola, Vail Resorts, Aurora Water, Colorado State University, and Colorado College lent a hand to meaningful conservation projects that contributed to the overall health of their backyard forests and waters. Local nonprofit organization Coalition for the Upper South Platte partnered with the NFF to lead volunteer groups which restored our shared public lands. Five Friends of the Forest Days took place between 2011 and 2014.

Through these five Friends of the Forest Days alone, we engaged 214 volunteers that contributed 1,326 hours of their time to restoration efforts.

Through these volunteer engagement activities the following restoration and on-the-ground projects were completed:

- 0.75 miles of trail improved, restored or naturalized
- 0.75 acres treated for invasive plants
- 900 trees and native shrubs planted
- 2.5 acres of riparian and other habitat areas restored
- 0.5 miles of roads restored or decommissioned
- 400 feet of fence constructed
Hayman Fire Science Symposium

In June of 2012, on the 10th anniversary of the Hayman Fire, the NFF partnered with the U.S. Forest Service Rocky Mountain Research Station, Joint Fire Science Program, Southern Rockies Fire Science Network, Pike National Forest, Coalition for the Upper South Platte, and Colorado Forest Restoration Institute to host the Hayman Fire Science Symposium: Lessons Learned After Ten Years of Recovery, Rehabilitation, and Restoration.

The symposium convened research scientists with land managers, planners, conservation organizations, and interested community members to highlight research and learning from ten years’ worth of replanting and restoration efforts. With the intent of benefitting future decisions about wildfire mitigation and collaborative restoration, the symposium proved a success.

Indeed, many of the lessons learned that were shared at the symposium were employed the following summer as land managers and local stewardship groups worked to recover from the Waldo Canyon and Black Forest Fires near Colorado Springs.

With the ever present threat of wildfire in Colorado and other Western states, the lessons learned through this restoration partnership and the science symposium will remain relevant for years to come.
Lessons Learned • • •

The success of this project has demonstrated that much can be done to mitigate post-fire impacts to burned watersheds in Colorado and throughout the West. When severe, large-scale fires burn in steep Western mountains, the damage and impacts to communities and water supplies can seem overwhelming and insurmountable. With earlier wildfires in similar landscapes, land managers and water providers typically only took action to ameliorate the downstream damage caused by post-fire erosion and sedimentation – dredging sediment from reservoirs and employing additional water quality treatments. This project marked the first time land managers took systematic, proactive steps at a large scale to tackle post-fire flooding and erosion issues in the upper watersheds, reducing the likelihood that sedimentation would ever enter into the water-supply chain.

Now, many of the on-the-ground techniques and lessons learned from the Hayman restoration project are being applied on other burned landscapes in the West. Indeed, when the 2013 Waldo Canyon Fire was still burning just west of Colorado Springs, the Forest Service and Colorado Springs Utilities enlisted the help of Hayman restoration project partners to begin designing restoration activities that would protect communities and water supplies from anticipated post-fire flooding and sedimentation. As soon as the Waldo Canyon Fire’s flames were extinguished, partners started constructing Hayman-style sediment catchments in priority drainages. Although, the Waldo Canyon burn scar still produced significant post-fire flooding, the quick application of erosion control techniques learned through the Hayman restoration project certainly protected communities and likely saved lives.

This project has also demonstrated the effect that NFF investments can have in building the capacity of local partners. By engaging and investing in local nonprofit partners, we were able to successfully accomplish our on-the-ground restoration goals and also build strong partners that will remain engaged in the stewardship of Colorado’s watersheds for years to come. Today, the Coalition for the Upper South Platte – NFF’s primary partner in the Hayman restoration project – is viewed as one of the foremost experts in post-fire restoration techniques. The group has also significantly increased its on-the-ground capacity since the beginning of the Hayman project, with at least a five-fold increase in staff size. Thus, NFF’s investments not only increased partner capacity to implement on-the-ground restoration projects on the campaign site but have also allowed the groups to increase their work on other projects in the region.
Project Contributions ● ● ●

- National Forest Foundation $796,224 ; 22%
- USDA Forest Service $389,059 ; 11%
- Implementation Partners $2,377,192; 67%

Totals are preliminary
U.S. Forest Service Match for NFF Road and Trail Work

DECOMMISSIONED
5.25 miles of system road
8.0 miles of non-system road

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A Committed Community • • •

With the completion of the Hayman restoration project on the Pike National Forest, the NFF’s efforts on this Treasured Landscapes site come to a close. However, restoration, stewardship, community engagement events, and local organizations continue to work in this recovering landscape. The Forest Service will continue to work with dedicated local organizations and the community at large with ongoing stewardship and restoration of this vital Colorado watershed.

- **Aurora Water:** In 2013, Aurora Water invested another $65,000 in the restoration of the Hayman burn scar through a contribution to the NFF. Recognizing the long-term value of their earlier investments in this project, Aurora Water is now more dedicated than ever to protecting the upper watersheds and green infrastructure they depend on for delivering quality water to their community. Indeed, they have established several new partnerships with the Forest Service and NFF throughout Colorado.

- **Coalition for the Upper South Platte:** In 2014, the NFF awarded a $130,000 grant to the Coalition for the Upper South Platte to continue their restoration efforts in the West Creek watershed. With this grant, the group will continue their long-term efforts to improve the recovery of the Hayman burn scar and the overall health of the Upper South Platte River watershed.

For More Information

National Forest Foundation
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