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Testimony Before the United States Senate
Committee on Agriculture, Nutrition, and Forestry

Hearing on:

Wildfire: Stakeholder Perspectives on Budgetary Impacts and Threats to Natural Resources on Federal, State and Private Lands

November 5, 2015

Introduction

Chairman Roberts, Ranking Member Stabenow, Senator Bennet and members of the Committee, thank you for holding this hearing today and for your attention to the important issue of wildfire and its effects on water supply and our nations' natural resources. I would like to thank the Committee up front for its extensive work to address wildfire and other watershed-focused issues in the 2014 Farm Bill.

My name is Chris Treese, I respectfully offer this testimony on behalf of the Colorado River Water Conservation District (Colorado River District) and the National Water Resources Association (NWRA).

The Colorado River District is the principal water policy and planning agency for the fifteen counties of northwest and west central Colorado. The River District is responsible for the conservation, use, protection, and development of Colorado's apportionment of the Colorado River. The River District comprises approximately 29,000 square miles, roughly 28% of the land area of Colorado. Seventy percent of our district is federal lands, and of those lands, the majority are managed by the U.S. Forest Service (USFS).

I also serve on the board of directors of the National Water Resources Association (NWRA). NWRA represents state water associations, irrigation districts, municipal water providers, end water users and their collective interests in the management of irrigation and municipal water supplies throughout the western United States and portions of the South. NWRA members provide safe, reliable water to millions of individuals, as well as families, agricultural producers, and other businesses throughout the U.S. For more than eighty years NWRA has worked to provide water in a manner that provides both economic and ecosystem benefits to communities and our natural environment.

Improving the condition of our nation's forested lands is of primary importance to water providers. National Forest lands are overwhelmingly the largest, single source of water in the U.S. and, in most regions of the west, contribute nearly all of the water that supplies our farms and cities.

The unhealthy state of our national forests, which were reserved specifically to protect water resources, has led to catastrophic wildfires that threaten the reliability, volume, and quality of water for tens of millions of Americans, along with the wildlife, recreational, and multi-purpose values of these lands. Large-scale, catastrophic wildfires today are more frequent and significantly larger than in the past, even the recent past. In Colorado alone, from 2004 through 2007, fires burned an average of 40,000 acres annually. However, from 2008 to 2015, that annual average jumped to 140,000 acres.

We greatly appreciate the Committee's attention to this important issue and believe it is critical that both forest management reforms and resolution of the "fire borrowing" issue are addressed in comprehensive legislation focused on improving the health and resiliency of our forests. Only by addressing both of these issues together can we ensure that on-the-ground forest management and restoration activities will proceed at the pace and scale equal to the problem and begin to improve the forest conditions that led to the devastating and costly fire season this summer and of the recent past.

Watersheds and Forest Health

The forested lands of the United States play a vital role in the water supply that much of our nation depends on. This relationship is no accident. The protection of the headwaters of our nation and "securing favorable water flows" is one of the foundational purposes of the National Forest System. Healthy forests provide a myriad of watershed, ecosystem, and recreation benefits. In a healthy forest ecosystem wildfire can be a natural, regenerative force. Unfortunately, as members of this Committee know, throughout much of the U.S. our forests are not healthy. This is particularly true in the western United States.

A healthy watershed, which in the West almost invariably originates on National Forest land, provides multiple environmental and health and human safety benefits. A healthy forest will mitigate both droughts and floods, create and protect a healthy and functional soil profile, remove and decompose pollutants, maintain biodiversity, provide natural beauty, and provide sustainable, high quality water.

Deteriorating forest health conditions impact numerous elements of water management including the hydrologic characteristics of watersheds: runoff timing, water yield, sediment transport, water temperature, and water chemistry. Unhealthy forests are increasingly prone to catastrophic wildfire. Fires that once burned with low intensity are now burning with greater severity, overwhelming exponentially more land and are scaring, instead of rejuvenating, landscapes.

The pervasive spread of pine beetle, spruce budworm, and other insect infestations have changed the landscape of our western forests for generations. Natural succession will occur, and someday these forests will again be dominated by pine and spruce trees, but for at least two generations of forest enthusiasts this landscape is forever altered. Whole forests today consist predominantly of standing dead trees, representing an obvious and immediate fire hazard, but as those trees fall their entropic tendency to form a "match stick" weave of

dead trees on the forest floor represents an exponentially greater likelihood of high intensity, catastrophic wildfire. These conditions must be addressed.

The 2002 Hayman Fire in Colorado was a high intensity fire that, within the 138,000 acres involved, burned 7,000 acres above Denver Water's Cheesman Reservoir. That wildland fire's conflagration spread as a crown fire but immediately dropped to a manageable and dramatically less destructive ground fire upon reaching the area above Cheesman that had been mechanically thinned prior to the fire.

Wildfire and Water Supply

High intensity wildfires have both immediate and long term impacts for water users. Wildfires can dramatically and adversely affect source-water quality, interrupt water storage opportunities, obstruct hydropower generation, hinder water delivery, and adversely affect downstream communities and ecosystems reliant on water originating on that forest. Even communities hundreds of miles downstream of the fire may be affected by the aftermath.

Key water and power infrastructure is increasingly at risk of wildfire's devastating effects. When fire affects this infrastructure there are both immediate and long-term impacts. This summer, the Pacific Northwest suffered a series of catastrophic wildfires. Fires burned through thousands of acres of forest, destroyed homes and businesses, and tragically took the lives of multiple wildland firefighters. One of these fires, the Chelan Complex fire, threatened the water supply operations of the Greater Wenatchee Irrigation District (GWID).

The Chelan Complex fire cut GWID off from its vital water supply when it knocked out the power infrastructure that GWID relies on to deliver water. GWID draws water from the Columbia River, but with no power it was unable to access its primary water supply. In order to bring a portion of its supply back online, GWID borrowed two 480-volt generators from the Bureau of Reclamation and also drew power from several smaller generators. These efforts, however, only rehabilitated a portion of its water supply. For almost a week, GWID's ability to deliver water was reduced by approximately 80 percent, going from 10,000 gallons per minute to 1,900 gallons per minute. Despite GWID's best efforts, the lack of water increased stress on high value tree crops, reducing productivity. The fire also destroyed a water supply pipeline, which will cost the district hundreds of thousands of dollars to replace.

Even if water providers are able to survive a fire event without losing infrastructure, they still face significant challenges. Many of wildfire's biggest impacts to water supply come once the fire is out. The flooding and associated erosion that too often follow a wildfire create a major threat to water supplies.

In a healthy forest watershed, vegetation holds soil in place and slows runoff, giving water time to soak into the ground. Under healthy forest conditions, a critical portion of rainfall and snowmelt is absorbed by the ground then percolates slowly through the soil later

emerging down-gradient on the surface, thereby providing a year-round supply of stream flow. Wildfires remove vegetation, bake soils to the point of impermeability, and almost guarantee post-fire flooding and erosion. High temperature wildfires, like those increasingly experienced in the West, exacerbate this problem by altering soil composition. When vegetation burns, it releases gases that can penetrate the soil. As the soil cools, these gases condense forming a water resistant, waxy layer on the ground, rendering the soil hydrophobic. High temperature wildfires also bake clay soils resulting in a vitrified, or almost ceramic, surface impermeable to rain and snowmelt. Soil can remain hydrophobic for several years after a fire has burned.[1]

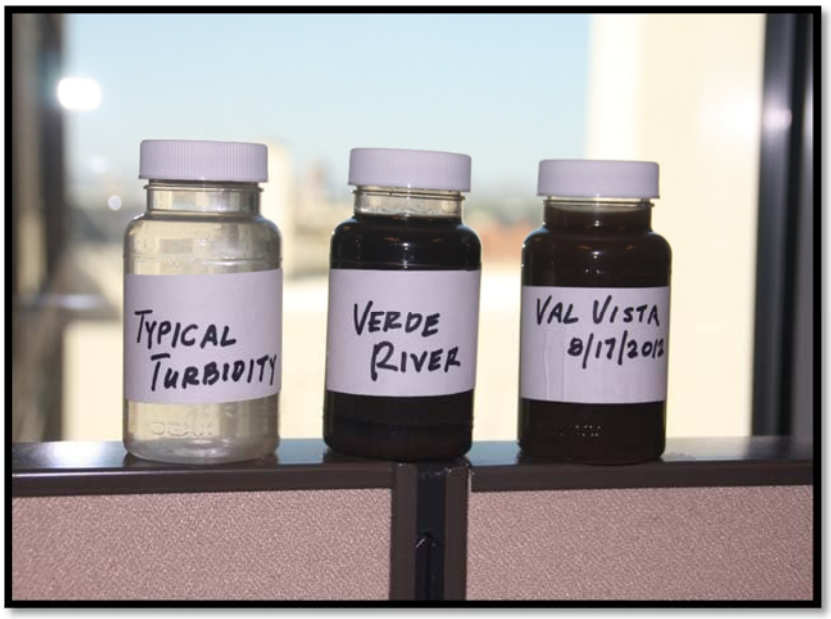
The lack of vegetation and hydrophobic soils increases the probability of severe erosion, floods and surface water pollution to rivers, lakes and reservoirs. The level of increased erosion is significant. In 2003 water providers, including the River District, worked with the Department of the Interior and Colorado State University to study the relationship between forests and water. This research found that in severely burned areas peak runoff rates can increase by a factor of 10 or more, and erosion rates may be multiplied 100 times relative to unburned areas.[2]

Mitigating these effects puts severe strain on local water providers. Denver Water estimates it has spent in excess of $27 million in the past ten years due to post-fire conditions, primarily erosional impacts.

Post-fire water supplies often see an increase in turbidity, metals content, and nutrient loads, turning clear, mountain streams the color of coffee – or worse. Beyond mere aesthetics, these are issues that must be addressed for health and human safety during water treatment. Cleaning this water to a standard safe for consumption adds substantial expense and strain on existing facilities.

These additional treatment costs are not insignificant. In Arizona, the Salt River Project (SRP) has seen significant increases in sediment in its water supply post-fire. The increase in organics and sediment in the SRP water supply from fires, coupled with ever-stricter water quality standards, have directly led to increased capital and operating costs at municipal water treatment plants. In many cases treatment facilities had to be upgraded by adding carbon filtration to handle the increased levels of organics and sediment at a cost of hundreds of millions of dollars.

[1] Dell Rae Moellenberg, "*Colorado State Experts Search for Signs of Life at Hayman Fire Site, Investigate Erosion and Water Pollution Prevention.*" Colorado State University, February 18, 2003.
[2] Lee MacDonald and John Stednick, "*Forests and Water: A State of the Art Review for Colorado.*" Colorado State University, 2003.



Example of post fire turbidity levels in Arizona's Verde River Basin. Image courtesy of the Salt River Project.

Storage and Hydropower Impacts

Post-fire erosion and debris flows also cause problems for water storage and hydropower generation. Increased levels of sediment and debris eventually flow into water storage facilities. This displaces capacity dedicated to water supply storage. Mitigating the increased flow of sediment is a difficult, expensive, and multi-year problem.

In Colorado, summer rains following a major wildfire in the watershed that feeds Denver Water's Strontia Springs Reservoir washed more than one million cubic yards of ash and debris into the reservoir. This significant inflow of solids filled the reservoir to seven percent of its capacity, requiring Denver Water to spend more than $16 million just on reservoir dredging that ultimately proved only marginally successful.

The water supply infrastructure of the West also plays a critical role in the generation of carbon-free, hydroelectric power. This generating capacity can also be affected by wildfire. Last year, in Northern California's Placer County, the King Fire burned a total of 156 square miles. Sixty percent of the fire burned at high intensity. This fire directly affected the Placer County Water Agency (PCWA) and its operations. PCWA provides drinking water for 250,000 citizens and enough renewable hydroelectric energy for 100,000 homes.

The King Fire stripped vegetation from the watershed that PCWA depends on. Precipitation events in areas burned in the King Fire have already affected PCWA, increasing the amount of sediment and debris flowing off the watershed. Once this debris entered lakes and reservoirs, it displaced valuable storage space, blocked spillways and in-takes, and ruined equipment and generating machinery.

PCWA estimates that it incurred $8 million to repair and protect its water and energy infrastructure immediately after the fire. Costs for 2016 could reach $10 million and continue for years. Debris could fill the reservoir and negatively affect water releases and hydropower generation.

The USFS estimates that over 300,000 tons of topsoil are poised for further erosion into the Rubicon River from the burned area. This means that PCWA customers' water and power supply will be threatened for years to come and will be subject to these cleanup costs again and again.

Environmental Impacts

Obviously, humans are not the only one that suffer when sedimentation in water increases. High sedimentation also adversely affects aquatic species, some requiring dramatic and costly rescue.

In 2012 biologists scrambled to protect fish in New Mexico from the aftermath of the Whitewater–Baldy Complex fire. On May 9, 2012, lightning in the Gila National Forest started one of the largest fires in New Mexico's history, burning almost 300,000 acres. After much of the fire had subsided in key habitat areas, a team from the U.S. Fish and Wildlife Service, the USFS, and New Mexico Game and Fish initiated collection, evacuation and relocation of Gila trout, one of the original species listed under the Endangered Species Act, from creeks in the burn area.[3]

Human Toll

While others testifying before this committee will address the cost of wildfire in human terms, I want to emphasize that my relatively light treatment of this sacrifice does not reflect a lack of concern or appreciation for the risks willingly assumed by these professionals. I live in Glenwood Springs, Colorado, site of the 1994 South Canyon fire and the largest, single loss of professional wildland firefighters' lives – until the Yarnell Hill, Arizona tragedy two years ago. The tragic deaths of 14 wildland fire fighters who came from other states to protect our small town has forever changed my community and our appreciation for the sacrifices these professionals accept for others every day.

Fire Borrowing

In 2015, fire suppression costs will exceed 50% of the entire USFS budget for the first time. In 1995, firefighting made up only 16% of the USFS's appropriated budget. Left unchecked, by 2025 fire costs could command more than two-thirds of the USFS budget. This would mean almost $700 million being diverted from non-fire programs. No agency can sustain its mission with this level of unplanned, diverted funding.

[3] Susan Montoya Bryan, "Raging N.M. Fire prompts rescue of threatened fish," Washington Post, June 18, 2012. http://www.washingtonpost.com/national/health-science/raging-nm-fire-prompts-rescue-of-threatened-fish/2012/06/16/gJQAJaVJlV_story.html

Since 2001, "fire transfers" have resulted in a 24% reduction to the USFS Vegetation & Watershed Management program. Ironically, this program includes pre-fire mitigation efforts that would otherwise reduce the likelihood and magnitude of wildfires. This trend directly hinders the work we're able to do in partnership with the USFS to protect our watershed lands, water resources, and system infrastructure.

Next Steps to Protect our Nations' Water Supply

There is a deep body of science and empirical evidence, as well as an increasing, though regrettable, amount of practical experience, that demonstrate the need for and importance of proactively managing our forests to protect water supply, water quality, terrestrial and aquatic habitats, and the broad range of other natural and socio-economic benefits that our forests provide.

I know that this Committee and members of Congress on both sides of the aisle recognize the importance of responding to our nations' forest health needs. I am particularly proud that my Congressional representatives, Senator Bennet, Senator Gardner and Congressmen Tipton and Polis have all introduced or cosponsored legislation aimed at addressing wildfire and forest health issues.

Partnerships:
Many of NWRA's members are currently involved in forest restoration projects aimed at improving forest conditions and protecting vital water supplies. We are investing tens of millions of dollars annually in restoration efforts, often using local funds to treat federal lands. Additionally, we are actively engaged in educating the public on the importance and benefits of forest health.

In Arizona, the Town of Payson, USFS, Bureau of Reclamation, the National Forest Foundation and Salt River Project signed a Memorandum of Understanding (MOU) on July 17, 2014. The MOU aims to reduce the threat of severe wildfire in and around the watersheds that drain into the C.C. Cragin Reservoir. The partnership was formed in response to the need for forest restoration activities on 64,000 acres to protect the C.C. Cragin reservoir, a water supply to the Town of Payson, Salt River Project and communities in northern Gila County. However, this project is just one example of a collaborative project of critical priority that must undergo environmental compliance processes that are expected to take at least two years before fuel reduction activities can begin on the ground. That leaves endangered species, the greater ecosystem, and the public's water supply vulnerable for at least two more fire seasons, despite the known risks of delay.

Legislation:
Federal actions must address both fire suppression funding and the planning and compliance processes in order to accelerate the pace and scale of work needed to protect our forest lands and water supply. Federal agencies must be directed and empowered to work together and assign responsibilities to avoid duplication. In an era of limited funding,

agencies must break down institutional silos of responsibilities and "turf" in order to fulfill Congressional intent.

Federal environmental permitting delays and lack of inter-agency communication and cooperation represent harmful and costly delays to many of these efforts. The all-too-common criticism of federal paralysis by analysis is especially costly in the context of pre- and post-fire mitigation. And I am not overstating when I suggest these costs are too often measured in human lives.

I commend this committee for including authorization in the 2014 Farm Bill of categorical exclusions (CE) for forested areas plagued by insect and disease. This provision has already been exercised in at least one of the national forests in my district. The Good Neighbor Program, which the Farm Bill continued, has been extremely beneficial, allowing coordinated treatment of adjacent private and USFS forested lands.

Additionally, I want to thank this committee for authorizing and funding the Regional Conservation Partnership Program in the 2014 Farm Bill. This innovative, competitive grant program provides another important opportunity for cooperative partnerships in furtherance of healthy watersheds, and one in which I'm pleased to report our district is actively engaged.

I am pleased and proud of Senator Bennet's introduction of the bi-partisan **S. 1997**, "the PREPARE Act of 2015." Recent mega-fires in the West have illuminated the fact that the Federal Emergency Management Agency's (FEMA) programs for disaster response and emergency assistance are not well adapted for wildfires. FEMA's programs and investments offer a minimal role for wildfire mitigation work, especially pre-wildfire prevention activities.

S. 1997 addresses both pre- and post-disaster mitigation deficiencies in current law and budgeting. While summertime wildfires have become a normal occurrence in the western U.S, over the last decade only about 0.5% of all projects funded by FEMA's Hazard Mitigation Assistance programs went to wildfire projects. In 2014, only 0.4% of all Pre-Disaster Mitigation funding went to wildfire mitigation.

NGOs, the water community, agriculture, industry, and federal land management agencies all share common interests in healthy forests. Across the west, countless partnerships have developed to provide both wildfire prevention and remediation efforts.

Another bill that I commend to the Committee's consideration is **H.R. 2647**, the Resilient Federal Forests Act of 2015. Both the Colorado River District and NWRA have endorsed this legislation and are not alone in this support. More than 170 organizations have endorsed this legislation including tribes, sportsmen organizations, agriculture groups and more than a dozen entities that represent water users.

H.R. 2647 builds on the good work this Committee did to address forest health needs in the 2014 Farm Bill. It incentivizes collaboration with local governments and stakeholders by expediting environmental review for collaborative projects up to 15,000 acres in size. It

also includes important provisions that will increase the yield and protect the quality of our headwaters. Importantly, H.R. 2647 also addresses "fire borrowing," where federal land managers must raid non-fire suppression accounts to pay for suppression activities. This practice has negatively affected funding for wildfire preparedness, forest restoration, and other activities. H.R. 2647 ends this practice by allowing FEMA to transfer funds to the USFS and Bureau of Land Management when all fire suppression accounts have been exhausted. Paying the bill for wildfire response must not come at the expense of programs that proactively address deteriorated forest conditions and reduce the risk of wildfire.

My mention of and our support for particular bills does not mean we think that they are perfect, nor that other wildfire bills, such as those authored by Senators Wyden, Heinrich, and others, are without merit. However, we are adamant that forest management reforms, increased partnership opportunities, and resolution of the "fire borrowing" issue must all be addressed in legislation and focused on improving the conditions of our forests and protecting the myriad benefits we derive from healthy forests. It is critical that we address these issues together. Additionally, federal policy and practice must recognize the savings from and superior return on pre-wildfire, prevention investments over those of post-wildfire mitigation.

Conclusion

Let me emphasize, the importance of long-term solutions. We did not arrive at the current conditions of our forests overnight, and we do not believe immediate resolution is possible. However, immediate action is imperative. The western water community that overwhelmingly relies on water supplies originating on our forests is committed to working constructively over the long term with our federal partners to correct the conditions of our national forests and our watersheds.

We urge Congress to embrace the immediacy of the need and the importance of resolving these critical conditions. NWRA and the Colorado River District recognize that providing a safe, affordable and reliable supply of water is worth the extraordinary efforts required.

Again, my sincere appreciation to the Committee for this opportunity and your attention to this vital issue.