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Testimony on Current and Future Impacts of Climate Change on the Intermountain West, including Drought, Wildfire Frequency and Severity, And Ecosystems

Before the
Senate Energy and Natural Resources Committee

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Introduction. Thank you, Chairman Bingaman and members of the Committee, for this opportunity to testify on the critically important issue of climate change and its impact on our region in general, and on the Santa Clara Pueblo in particular. My name is Walter Dasheno. I am the Governor of the Santa Clara Pueblo, as well as the Chairman of the Eight Northern Indian Pueblos Council.

As you are aware, the Santa Clara Pueblo has embarked on a multi-generational effort to restore our forests and our watershed after the devastating Las Conchas wildfire. For the purposes of this hearing, there are two key questions. First, to what extent did climate change contribute to this disaster? And second, to what extent will climate change impact our recovery efforts over the next 50-100 years?

With regard to the first question, I believe that climate change was one of several significant factors contributing to the disaster. At the time of the fire, it was reported that the living trees in the canyon had lower moisture content than the wood you would typically buy at a lumber yard. This is a result of drought conditions in the Southwest that the scientific community continues to associate with climate change. In addition, higher temperatures in general create more conducive conditions for wildfires. I must note, however, that climate change was not the only reason this fire was so devastating. The forest had become unhealthy, with excessive undergrowth and too great a tree density, making conditions ripe for an intense fire that would kill the mature trees. As a part of managing the impact of climate change, we must manage the conditions in our forests.

As for the second question, based on our preliminary research, we are very concerned that continued rapid climate change will have a significant and highly adverse effect on our efforts to regenerate the forest and restore the Canyon ecosystem. Warming alone is likely to lead to a decline in suitable habitat for the indigenous tree species of the Canyon. Moreover, if we continue to experience more frequent and more severe wildfires we could reach a tipping point at which the trees may no longer regenerate. The Las Conchas Fire reburned an area where we had planted a million trees in an effort to recover from an earlier wildfire. Theoretically, with the change in climate other plant and animal species adapted to the new climate would move in.

However, we do not know how long that will take, nor whether any such species actually exist, or what the forest would look like after such species establish themselves. The answers to these questions will determine the health of the Santa Clara Canyon and, because of the Canyon's central importance to our culture, the health, well-being and identity of the Santa Clara people.

Background on the Las Conchas Wildfire. In the summer of 2011, the Santa Clara Pueblo was devastated by the Las Conchas Fire, at the time the largest wildfire in New Mexico history (although that unfortunate record has already been eclipsed by the Whitewater-Baldy Complex Fire. Although mercifully no lives were lost and no homes at Santa Clara were burned, we still saw our traditional and treasured homeland and spiritual sanctuary, the Santa Clara Canyon, practically destroyed. We estimate that more than 16,000 acres of our forest lands burned in this fire and, together with the lands that we lost in the Oso Complex Fire of 1998 and the Cerro Grande Fire of 2000, 80% of our forests and a huge part of our heritage has been destroyed. In addition, the fire burned thousands of acres of our traditional lands that are outside our current reservation and that continue to hold cultural sites and resources of great importance to us. This area encompasses our lands of origin, the P'opii Khanu - the headwaters of our Santa Clara Creek, and numerous cultural and traditional sites. In addition, the loss of the forest is devastating to wildlife and wildlife habitat, recreational resources, and to the purity of our water - which we use for irrigation and many traditional purposes. (See attached illustration of fire impact on Santa Clara watershed.) Throughout this tragedy, the Santa Clara people have shown grit and determination to persevere and to begin the long road to recovery so that while my generation may never see the canyon in its glory again, that will not be said of the next generation.

Because the Santa Clara Canyon has been stripped of its vegetation, the Pueblo is at tremendous risk of flooding. Over 50% of the Santa Clara Pueblo watershed burned during the Las Conchas fire. Because of the high severity of the burn, there has been a dramatic reduction in the infiltration rates in the burned area – the soil is now what is termed by soil scientists "hydrophobic." This has resulted in a four-to eight-fold increase in runoff and sediment/debris flow into the Santa Clara Creek, posing a severe threat to the lives and safety of the people of Santa Clara Pueblo and increasing the potential for widespread property damage. The channel through Santa Clara Pueblo no longer has the conveyance capacity necessary to safely pass large post-fire flows. Hundreds of residential structures including several public structures are at risk from flood and debris flows if no action is taken immediately. (See attached illustrations of the potential flood risk zone to Santa Clara for a ten-year event.)

A mere 1 inch rain event over 8 hours, or what hydrologist refer to as an average monsoon season storm, on August 21, 2011 led to intense flooding and the emergency evacuation of Santa Clara and US Army Corps of Engineer personnel. This rain event resulted in a Presidential Disaster Declaration. As the Department of the Interior, Interagency Burned Area Emergency Response ("BAER") Team noted the intense flames from the fire burned trees and vegetation off the steep slopes of the canyon and heated the soils causing severe damage to the natural resources of the area and placing the downstream tribal members of the Santa Clara Pueblo at risk to extreme flooding. The post-fire watershed effects were rife for massive landslides and debris flows which occurred on August 21, 2011. The August 21, 2011 event produced massive debris (including boulders) and severe mud flows to the canyon bottom. The Canyon reservoirs were overwhelmed (over topped) by this average rainfall event following the fire and are now

full of sediment. Flood protection emergency measures put in place after the Las Conchas fire were inches away from being compromised. It is important to note that this storm was an isolated thunderstorm over a small portion of the Santa Clara watershed (one drainage) and not over the entire watershed (what hydrologist refers to as a general storm). Another similar event occurred this past July, destroying much of the recovery work we had undertaken over the prior year. If the rain event of August 21, 2011 had occurred over the entire post fire Santa Clara Pueblo watershed, the Santa Clara Pueblo itself would have been devastated.

I live in fear of the destruction of my Pueblo and the possibility of loss of life. This has motivated my efforts, and that of the whole Santa Clara government, to secure the funding needed to put in place adequate flood control measures. In just the last few weeks, the Federal Emergency Management Agency (FEMA) has allocated very significant funding to help us restore the water control structures in the Canyon and do other important work. We continue to work with other Federal agencies, such as the Bureau of Indian Affairs, Army Corps of Engineers, U.S. Forest Service, Natural Resources Conservation Service and others in the complex effort to put in place flood mitigation measures and a forest restoration program. We have been very grateful for the support of these agencies, although continued funding is needed to achieve success.

However, we are only at the beginning of the flood mitigation and forest recovery effort. The fire has raised numerous, interrelated, short and long-term concerns for Santa Clara and other surrounding communities, almost all of which are further complicated by climate change. First, during the summer monsoon season, we have faced every afternoon the threat of a thunderstorm that would send torrents of water and debris down the Santa Clara Canyon and Creek, creating a huge risk of dam failure and catastrophic flooding for our homes, public buildings and irrigation system. Second, we must address the environmental impacts of this fire. This includes the physical health impacts from the huge quantities of smoke, as well as the devastating emotional impact to our community of such a great loss. It also includes water quality impacts as tons of ash, debris and other materials flow into the Santa Clara Creek affecting fisheries, wildlife consumption, agriculture and cultural uses, and safety issues within our Santa Clara Canyon due to the destabilized landscape resulting in falling boulders and dead and down trees. This runoff flows into the Rio Grande, affecting water quality for communities like Santa Fe that are downstream or that use the Rio Grande. Third, we are still assessing how to recover from the loss of an unprecedented amount of cultural resources and sites, from damage to sacred places, to the loss of animal and plant species that have been integral to Santa Clara cultural and spiritual practices for generations. Fourth, Santa Clara has suffered extended financial impact, including not only the direct efforts to address the fire, but also from the temporary closure of Puye Cliff Dwellings, the reduction in arts and crafts sales, and the decline in tourists and visitors to our hotel. Fifth, we still need fire suppression resources to protect the remaining 20% of our forests. Finally, we must address the long term restoration of the forests. This is a project that we anticipate will take many decades, but one to which we have already set our minds.

The Effect of Climate Change on Forest Regeneration and Recovery. We are still struggling with the post-fire consequences of the Las Conchas wildfire and have only just begun the infinitely more complex process of addressing the regeneration of the forest in the Canyon. However, we have looked at research into the effect of climate change on forest regeneration, including a study of the Greater Yellowstone Ecosystem undertaken by academics at the

University of California – Merced (see http://www.ucmerced.edu/news/study-climate-change-increase-yellowstone-wildfires-dramatically).

The predictions of that study look a lot like both our immediate past and our likely future. For example, it predicted that the expected rising temperatures caused by climate change could increase the frequency of large wildfires in Yellowstone to an unprecedented level. While not quite on an annual basis, we have experienced the harmful effects of four major wildfires in the last 15 years, none of which were started on the Pueblo. While fire can be a natural and important part of the maintenance of a healthy forest system, fires of this intensity and frequency are very harmful. We still have sacred lands, just off our reservation which have not burned, but remain under threat.

These fires will likely create a major shift in the nature of the Santa Clara Canyon's ecosystem. We are not exactly sure what that shift might look like. In the study of the Greater Yellowstone Ecosystem, the authors predicted "fewer dense forests and more open woodland, grass and shrub vegetation, with forests becoming younger, the mix of tree species changing and some forests failing to regenerate after repeated fires. This would affect the region's wildlife, hydrology, carbon storage and aesthetics."

Of course, as the fires create a fundamental change in the Canyon's ecosystem, the affect of climate change and the nature of future fires will be changed, making both predictions and natural resource management even more difficult.

There is a risk that warming alone is likely to lead to a decline in suitable habitat for the indigenous tree species of the Canyon and the projected increase in frequency and severity of wildfires could accelerate that process to a tipping point at which the trees may no longer regenerate. Theoretically, with the change in climate other species adapted to the new climate would move in. However, we do not know how long that will take, nor whether any such species actually exist, or what the forest would look like after such hypothetical species establish themselves. In the end, there is great uncertainty regarding how the Canyon's ecosystem will be transformed. Predictions depend on which climate model is chosen, for example, and how accurate that model ultimately proves to be.

Mitigating the Risk of Catastrophic Wildfires. Santa Clara has a large forestry department, numbering some 40 personnel. This department is widely regarded as outstanding. Santa Clara fire crews and equipment were assigned and on the front lines fighting the Las Conchas Fire. We have a dedicated commitment to the maintenance and restoration of healthy forests on, around and adjacent to the Pueblo. In the management of our own resources, we have worked to ensure against the threat of forest fire. And yet, in the last decade we have faced four forest fires that have threatened our forests – the Oso, Cerro Grande, South Fork and Las Conchas fires – and none of them originated on our lands. Although fate and climate change play their part, we have suffered horrible consequences largely due to the failure of others to properly guard in some fashion against causing a fire.

For the last several years, Santa Clara has been actively working with the U.S. Forest Service, the BIA and others in an effort to establish a forest management plan and program that would

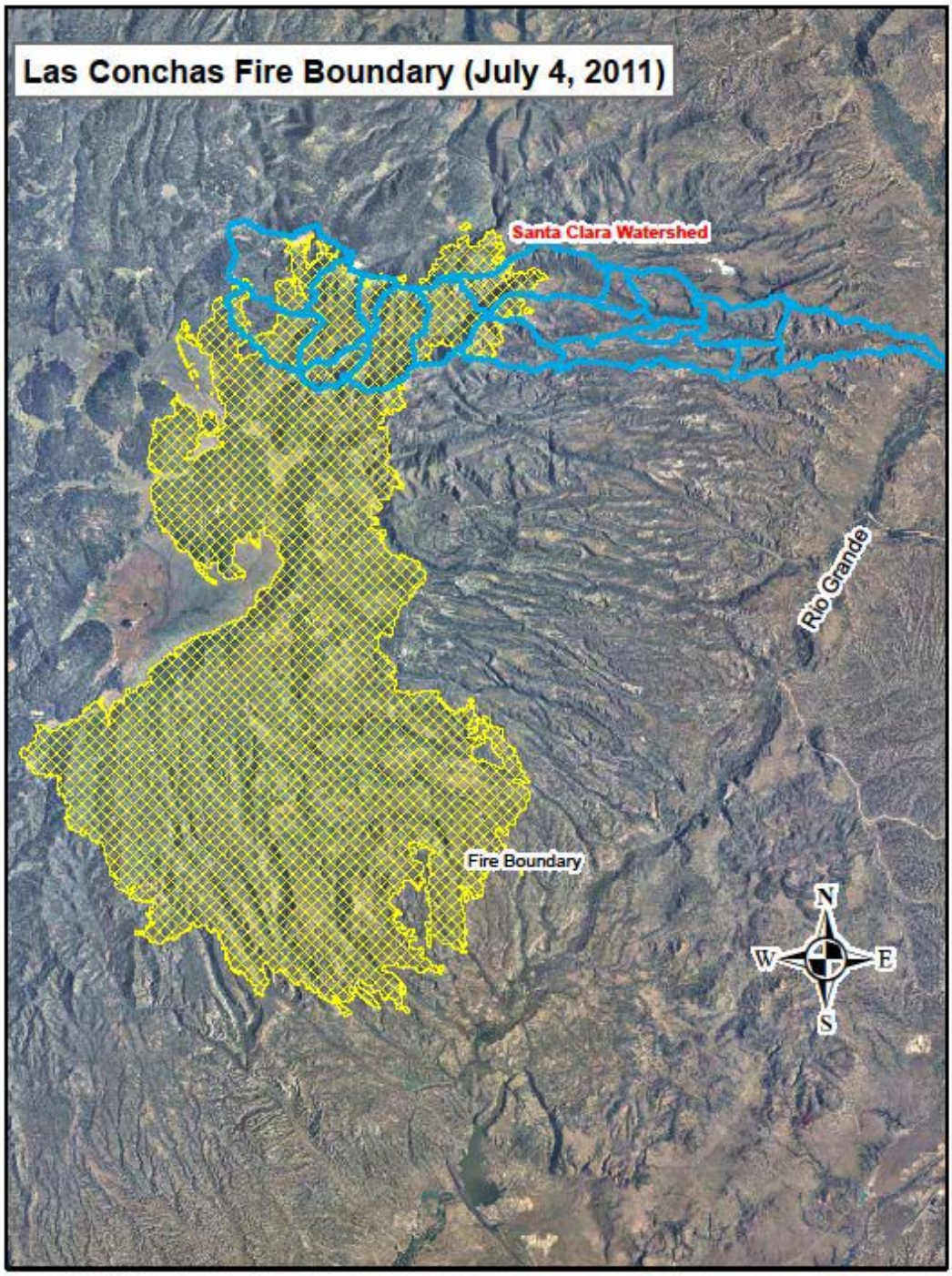
have prevented this catastrophe. This effort has involved numerous meetings in New Mexico and several trips to Washington. In particular, Santa Clara was working on establishing a partnership under the Tribal Forest Protection Act with the Forest Service to begin a long-term project to address the health of the Forest Service lands around the Pueblo. We were also seeking to assure that if the Valles Caldera, which is adjacent to the reservation, was transferred to the National Park Service, that any agreements we had reached would be honored in the transfer and new agreements could be put in place with the new administrators.

We know that these efforts would have eventually succeeded given enough time, but we ran out of time. We saw in the Las Conchas Fire that where the Santa Clara had completed work on fuel breaks the fires was stopped. In an area where the Santa Clara Pueblo has had 80% of its forested land base burn since the Cerro Grande fire, every sliver of green timber makes a difference to stabilizing soil. Nonetheless, in the ten years since the Cerro Grande fire, Santa Clara has planted nearly 1.5 million trees, most of which were burned in the Las Conchas fire, destroying the Pueblo's great labor of restoration of the past decade. Despite our full awareness of the threat, and our efforts to enter into partnerships and seek funding to address the threat, we ran out of time. Nevertheless, we still hope these partnerships will enable Santa Clara to play a significant role in the restoration and rehabilitation of the Forest Service lands around our current reservation. We also look to put together a forest management law that will protect our forests and which we think should influence the management of the forests around us, which have posed such a threat to our lands.

Providing for Tribes to Seek a Federal Disaster Declaration. Because only a state governor can set the process into motion for a Federal disaster declaration, we would ask this Committee to address why tribal governments, who have a direct government-to-government relationship with the United States, must go through state governors to request Federal disaster relief. Such relief clearly falls within the Federal trust obligation and has the potential to expedite disaster recovery assistance. We would therefore urge this Committee to support legislation that allows a tribe to directly request this relief when it is needed. In particular, I would draw your attention to S. 2283, which would provide this authority.

Federal Resources for Both Short- and Long-Term Planning and Recovery Efforts. The health of our community, and that of many other communities from the Inter-Mountain West, will turn on developing a greater understanding of the affect of climate change, as well as ways to both mitigate its consequences and engage in effective restoration where those consequences, such as the Las Conchas Wildfire, have already occurred with devastating effects.

Conclusion. Never again in our lifetime will we see our traditional and treasured homeland and spiritual sanctuary, the Santa Clara Canyon, as we have known it. It will take generations for our community and lands to recover from the devastation of this fire and, because of climate change, it is not clear what that future will look like. But this is our only homeland; it is the place we have been entrusted with since time immemorial. While we intend to devote the resources we can to the healing of our land and the protection of our community we do not have the resources to do it alone. We turn in this hour of need to our Federal trustee and ask for your sustained assistance in addressing this calamity and assuring the remediation of our sacred homeland with a long-term perspective on how this can be done during a period of what now appears to be almost inevitable rapid climate change.


Las Conchas Fire Boundary (July 4, 2011)
Santa Clara Watershed
Rio Grande
Fire Boundary
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Potential Flood Plain through the Santa Clara Pueblo