

Building a Social Contract for Implementing Landscape-Scale Forest Restoration in Northern Arizona's Ponderosa Pine Forests

The need for landscape-scale community protection, restoration, and fire management

Ponderosa pine forests stretch almost continuously from the south rim of the Grand Canyon in north-central Arizona, across the vast Mogollon Rim to the White Mountains of eastern Arizona and the mountains of southwestern New Mexico. Forests across this expanse surround and support forest-embedded communities, and provide invaluable wildlife habitat, recreational resources, and ecosystem services ranging from clean water supply to carbon storage. Unfortunately, these forests have become degraded by unsustainable historical land uses (such as fire suppression and old-growth logging), and are currently threatened by unnaturally severe fire, invasion by non-native weeds, and climate change.

While many citizens in northern Arizona have worked for years to protect communities, manage fires, and restore ponderosa pine forests with a combination of approaches ranging from mechanical thinning to prescribed burning to Wildland Fire Use (allowing naturally ignited fires to burn), efforts have been relatively small scale.

Especially within a climate change context, and given the likelihood of larger, landscape-scale fires burning in the future, our efforts thus far to restore ponderosa pine forests have been insufficient if we are to have any hope of meeting landscape-scale restoration goals. We need landscape-scale restoration efforts that adequately protect communities, restore and protect wildlife habitat and watershed integrity, significantly reduce the size of large fire events, and return more natural, low-intensity fire to these fire adapted forests as soon as possible. We need restoration treatments including strategically placed mechanical thinning treatments, prescribed burning, and safe Wildland Fire Use, occurring across a majority of the forests in northern Arizona, not a slim minority, as is the case now.

Factors historically challenging landscape-scale forest treatments

Two primary factors have constrained the expansion of restoration efforts from areas around communities to the broader forested landscape in the region. First, there has been until recently no formally negotiated social agreement regarding the extent and types of restoration efforts appropriate in wildland forests. Second, such treatments have been cost prohibitive, ranging from \$50/acre for prescribed burning or Wildland Fire Use treatments, to over \$1000/acre for mechanical thinning treatments. With some form of treatment needed across hundreds of thousands to millions of acres in the region, such per-acre treatment costs quickly exceed our restoration capacities as reflected in current and projected future Forest Service annual budgets.

Building a social contract

Over the last several years, restoration proponents across the state have been systematically building social agreement regarding ponderosa pine forest restoration. Beginning in 2003, the Governor's Forest Health Advisory and Oversight Councils (precursors to the current Governor's Forest Health Council) developed consensus-supported guiding principles relating to restoration, community protection, fire management, and sustainable restoration-based economic development needs across the state (see <http://www.azgovernor.gov/fhc/Resources.asp> for more information). Building upon the foundation of agreement expressed within these principles, the Governor's Forest Health Councils initiated an ambitious effort in 2005 to develop explicit strategic recommendations for forest restoration across the state. Working with hundreds of citizens over a period of two years, the Councils developed the *Statewide Strategy for Restoring Arizona's Forests*, a strategic plan for the state outlining critical findings, needs, and strategies across nine forested landscapes in the state. The document was vetted in town hall meetings across the state, receiving strong support from Tucson to Eagar to Flagstaff. After incorporating input from hundreds of citizens across the state, the Councils unanimously supported and Governor Napolitano endorsed a final *Statewide Strategy* document.

The *Statewide Strategy* outlines five key strategies, 14 major recommendations, and 50 action items ranging from appropriation needs to research priorities, to land use strategies, to collaboration and public education mechanisms. One key chapter in the document addresses one of the most historically contentious aspects of forest management in the Southwest. Chapter 6 of the *Statewide Strategy*, titled "Economic Considerations for Restoring Forest Health", identifies critical challenges and strategies relating to the utilization of forest restoration by-products. Recognizing that restoration objectives must explicitly and continuously drive any utilization and industry creation, the *Statewide Strategy* recommends bolstering appropriately-scaled and restoration-driven industries capable of offsetting restoration costs. More specifically, the *Statewide Strategy* identifies the need to characterize the amount of wood and biomass available to industry across the state as a function of ecologically appropriate, social agreement-based restoration activities.

As the *Statewide Strategy* moved closer to completion in late 2006, the Forest Service agreed to fund the *Analysis of Small Diameter Wood Supply in Northern Arizona* (hereafter referred to as the Small Diameter Wood Supply Study) - an effort aimed at characterizing availability of restoration-generated wood and biomass across northern Arizona. Over the course of 9 months in 2007, the Forest Ecosystem Restoration Analysis Project convened a wide spectrum of stakeholders (including industry, environmental NGO, community representatives, and others) to develop agreement regarding the extent and type of restoration treatments that should occur across the Mogollon Rim over the next twenty years. The group developed consensus agreement describing the nature of such treatments across nearly two-thirds of the 2.4 million acre Mogollon Rim study area. As part of this agreement, the group identified approximately 40% of the landscape that should be

considered available for some form of mechanical thinning. Small diameter tree thinning activities proposed across these acres were estimated to be capable of generating more than 900 million cubic feet of wood across 1 million acres that could be thinned at a rate of approximately 50,000 acres per year (an increase of 30,000 acres per year) for the next 20 years (see http://www.forester.nau.edu/project_woodsupply_finalreport.htm)

Implementation Efficiency

Following the completion of the Small Diameter Wood Supply Study, the Governor's Forest Health Council and other stakeholders have been working with U.S. Forest Service staff to identify mechanisms whereby agreed-upon community protection, restoration, and fire management treatments could be accelerated over the next 10-20 years. The group has also been specifically addressing the potential for appropriately-scaled industry, robust social agreement, and use of emerging technologies to help offset treatment costs, thus assisting in treatment acceleration. Based on the work of the group, it is anticipated that solutions can be designed where industry could absorb most or all the costs of extraction, hence saving the Forest Service an average of \$550 per acre compared to current costs, and where the costs of preparation, planning and administration could be reduced from a current estimate of \$360 per acre down to \$170 or less per acre. Additionally, possibilities have been explored for a contribution of the industry to the costs of preparation, planning and administration, thereby further reducing the costs to the Forest Service. Together, these cost offsets and cost reductions could result in savings in the \$200 to \$250 million range for the Forest Service during the implementation of restorative mechanical thinning over 300,000 acres within 10 years.

Moving forward responsibly and ambitiously

Given the ecological trajectory of northern Arizona's ponderosa pine forests, especially considering compounding stresses associated with climate change, we need significantly accelerated community protection, restoration, and fire management treatments across northern Arizona. Without such acceleration over the next twenty years, we are likely to see large-scale unnaturally severe fires foreclose our options for restoring natural fire to these forests in a more strategic fashion. Such acceleration does not require thinning every acre. It does require integrating strategically-placed mechanical thinning treatments with prescribed burning and Wildland Fire Use treatments at landscape scales.

Expanding mechanical thinning treatments (that would be necessarily integrated with prescribed burning and Wildland Fire Use across the Mogollon Rim) at a rate of 30,000 acres per year, as supported by consensus recommendations in the Small Diameter Wood Supply Study could cost a great deal of money. U.S. Forest Service estimates indicate that expanding such treatments might cost as much as \$300 million over the next ten years. Especially in the current economic climate, it is

highly unlikely that we will experience a substantial influx of federal appropriations that would allow treatments to occur at or even close to this scale.

If we are to see restoration accelerate across the region as environmental conditions and social agreement suggests is necessary, we need significant efficiency gains in per acre treatment costs. Substantial efficiency gains can be made by capitalizing on social agreement whenever possible to avoid costly controversy. Additional efficiencies can be gained by working at larger planning and implementation scales, and by using available, relatively low-cost technologies for assessing current conditions, defining restoration strategies, and monitoring restoration effectiveness at landscape scales (see www.forestera.nau for a description of such technologies). Finally, efficiency can and must be gained by allowing sustainably designed industry to utilize restoration by-products, thus offsetting the overall cost of treatments.

Restoration Industry Partnerships

Constituents across the state have agreed for years that the industry tail must not wag the forest management dog. Fortunately, we have a strong example of industry appropriately supporting community protection and restoration goals in the White Mountains Stewardship Contract (WMSC). While maintaining our commitment to the WMSC, we need to learn from its example and build upon its strengths as we consider options for partnering with industry in accelerating restoration across the region.

As we learn from the WMSC and build upon its successes, it is essential that we develop partnerships with industries capable of simultaneously restoring forest health, honoring existing social agreement, and offsetting per-acre treatment costs. Arizona Forest Restoration Products (AZFRP) (www.azfrp.com) is one such industry that has, so far, offered all of these capabilities. AZFRP has committed to utilize – in the process of manufacturing oriented strand board - only small diameter trees, at a rate well within the bounds of ecological sustainability and social acceptability identified within the Small Diameter Wood Supply Study. It has actively contributed to defining the social agreement developed over the last three years, and is committed to support that agreement. Additionally, it has agreed to support, help develop, and abide by longer-term contracting mechanisms built around transparency, collaboration, multi-party monitoring, and scientifically rigorous adaptive management. Finally, it has offered the potential to significantly offset the costs of mechanically thinning up to 30,000 acres per year of small diameter ponderosa pine forest. AZFRP has the potential to help catalyze forest restoration in the region, while creating approximately 600 restoration-generated jobs, and injecting into rural economies up to \$200 million per year in restoration-generated revenue.

Even with the foundation of support and partnerships developed thus far, significant risks remain in moving forward with restoration at larger scales. Our history is replete with examples of unsustainable resource extraction and exploitation. Our history is one of ecological hubris and shortsightedness.

Nevertheless, we must balance these risks with the risk of continued ecological degradation across a forested landscape that cannot afford such degradation.

Opportunity For Success

We have within our grasp, today, the scientific foundation, the social agreement and support, the partnerships, the vision, and the strategy to implement landscape-scale community protection, restoration, and fire management in northern Arizona. We must translate this unprecedented capacity into long-term contracts that simultaneously offer dependable supply to restoration-based industries, and ensure transparent, collaborative, science-based, and adaptive project planning and implementation over the coming years. Formulating such contracts will require commitment on the part of the U.S. Forest Service, support by communities and civic leaders, and collaborative engagement by a wide variety of invested stakeholders. We have demonstrated, as a community, that we can and must meet this challenge.