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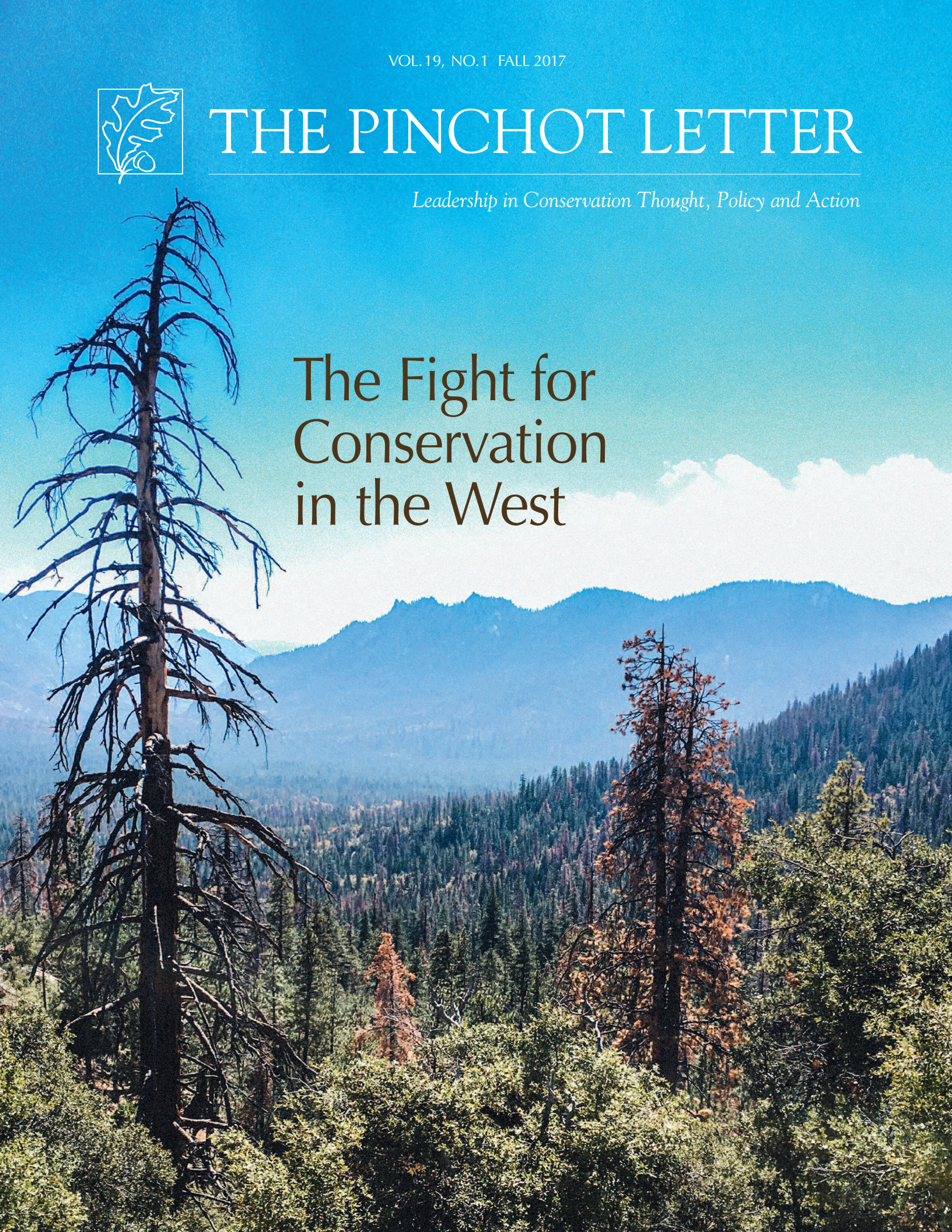
THE PINCHOT LETTER

Leadership in Conservation Thought, Policy and Action

The Fight for Conservation in the West



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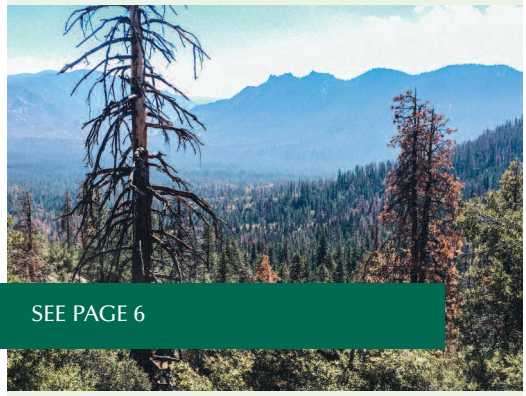

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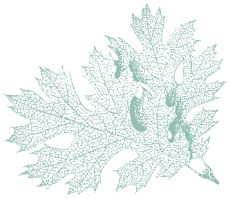

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FROM THE PRESIDENT

Investing Efficiently in Forests

A friend once remarked to me how fortunate it is that the U.S. can afford inaction when natural resources are wasted. At the time we were looking at a fire-ravaged forest in California's Sierra Nevada. Actually, it was not a forest any longer, and perhaps will not be for some decades hence, as the fire had burned so hot that a thirty-inch trunk had been reduced to a trench of ash in a shiny black slope of hardened earth. The snow and rain to come would of course flow from that slope undeterred by altered forest soils.

This burned ground was upstream of the Oroville Dam, which national media has made one of the many emblems of decline in our national infrastructure. As writers point out in this issue of *The Pinchot Letter*, the dam is just one part of the infrastructure that provides water. The source water area, the place where precipitation first becomes water supply, is the forest. When and how it's delivered behind the dam and how much sediment comes with it has implications for cities downstream, in this instance affecting the physical and intellectual capital generated by Sacramento and San Francisco. The crumbling dam is only the middle man, which can be replaced or repaired in a year or two. The forest cannot be replaced or repaired in less than a decade at the least. Right now, the cracks in our forest infrastructure are only widening.

> "The friends and the enemies of the forest have both said more than they could prove ..."
>
> — Gifford Pinchot, 1905[1]

Aided by the scientific passions of its second chief, Henry S. Graves, the U.S. Forest Service has helped the world understand how watersheds function with and without trees. Field experiment stations in Colorado, Georgia, Oregon, New Hampshire, and elsewhere have shown that while forests tax the water they receive (a healthy share consumed by evapotranspiration), generally they pass along pure water in steady installments of underground and overland flow. Perhaps most importantly, a healthy forest will keep out most sediment. The science of watershed hydrology, at least in terms of water yield during the Holocene Era, is well settled. But we are now in the Anthropocene, or as fire scientist Dr. Stephen Pyne has called it, the Pyrocene-when the burning of fossil fuels and forests are part of the same phenomenon.

Fire is of course a natural and regenerative force to which forest ecosystems were once well adapted. And though what is considered a natural fire regime is not settled science, enough of the problem is undebatable—threats to irreplaceable ecosystems, water supplies, and people already in the wildland-urban interface—that action is necessary. There is also enough consensus that forests are not as well adapted to the severity and frequency with which droughts and fires now seem to be occurring. In the Sierras for example, there are more than 100 million dead trees, roughly a quarter of the forest. This problem is not confined to California, it exists throughout the western U.S. and beyond.

A more expensive problem is that people are not well adapted to coming changes in the fire regime. We will experience supply chain disruptions in the form of ill-timed and episodic slurries of water that we cannot store, treat, or use as we are accustomed. We need to do three things, in order of increasing difficulty: invest in this supply chain, roll back global CO_2 concentrations, and become less reliant on water. The good news is that investing in forests will help with water supplies and CO_2 concentrations. The bad news is that investing in forests as infrastructure is still regarded by some as the self-serving pitch of all those working to manage and protect forests. So perhaps the place to start is focusing on what we must do, and work efficiently in places that would eventually have to be defended or restored at greater cost.

> Nature is conservative.
>
> — Frederick O. Bower, 1898[2]

One of the least discussed tenets of conservation is the principle of "efficiency." Gifford Pinchot wrote incessantly about the need for efficiency in governance and in use of natural resources. He once wrote that "…the outgrowth of conservation, the inevitable result, is national efficiency."[3] At the time Frederick Winslow Taylor was championing the idea of efficiency. To Pinchot, efficiency could reduce wastefulness in resource management, compel only but the necessary use now to preserve resources for future generations. But "Taylorism" soon became the religion of industries seeking

to squeeze labor, and through opposition from the labor movement, fell from favor among the Progressives. Nevertheless, Pinchot was proud of the efficiency of the Forest Service as an agency and its position as a beacon of administrative effectiveness within government.[4] He also deplored waste. I presume to believe that Pinchot and others of the Progressive era would be appalled by the notion that we can "afford to waste our natural resources."

There is a drumbeat for investment, new industries of all kinds (and especially biomass energy and tall wood buildings), which show promise and may get to scale when introduced in the right setting. The reasons for failure or slow progress in forest restoration are many: want of long-term agreements, distance to the resource, environmental concerns, policy change, procedural delays, supply chains, etc.[5] Five years into the much celebrated 4FRI project in Arizona, fewer than 9,000 acres of the planned 50,000 have been treated.[6] California, which has tried harder than any state to make lemonade from the lemon of catastrophic wildfire, has seen more than half of its biomass energy generation facilities close since the 1990s with the sunset of subsidies. Their Public Utility Commission now debates whether modest rate-hikes are worth getting them back online, just as the stockpile of biomass within the woods expands.[7]

For want of action CalFire now operates an expensive fleet of harvesters, haulers, and burners to incinerate Sierra Nevada's dead trees so that they will no longer burn in the woods. The Forest Service and CalFire are together investing $43 million to deal with the situation—$11 million for the new equipment.[8] Where once lower intensity fires culled and regenerated the forest, climate change introduces extremes at rates beyond adaptable limits. To avoid damage to homes, wildlife, water supplies, and long-lived ecosystems we are now bringing waste to nature. The costs of this waste are borne by taxpayers. Perhaps it is necessary, but it is a tragically inefficient use of scarce resources. There may be no clearer demonstration of the price of inaction, and the requirement of foresight on what may be most efficient and least wasteful.

Accompanying these discussions is the fond hope that when public policy does not lead to a solution, the private sector will rise up and solve the crisis. Perhaps there is belief that a venture capitalist in San Francisco worried about her water supply will help save us from public inefficiencies or indebtedness. Something akin to this happened in Denver—water utilities investing in forest restoration. Of course private investment in public lands, for all that they provide is most welcome, and in fact, increasingly anticipated.[9] But private investment will still require good public policy that assures reliable implementation and efficient operation. Agencies will at least need to help decide where demand has ready supply on public lands, based not only on where trees are dead, but where there is compelling public interest, social license, and capacity to do something about it.

> "Efficiency requires a pragmatic sense of the necessary, and making sure priorities reflect economic and political realities, along with ecological needs."

Recently the Brookings Institution hosted a meeting on how and where to invest in transportation infrastructure.[10] The insights were not obvious. Harvard Professor Edward Glaeser suggested that you should not always invest where infrastructure is dilapidated, but where new infrastructure will assuredly be used. Some infrastructure investments are GDP-neutral at best: they are never fully utilized or they entice only relocation of businesses that were thriving without public investment. In other words, invest in places that will know what to do with new roads and traffic lights, and know your return on investment. This is sobering but necessary, and poses questions about forests for which we do not have satisfactory answers.

For much of the history of forestry in the U.S., efficiency was associated with stopwatches at logging operations. But in conservation, efficiency must have a higher meaning, and acting based on an understanding of how we must manage to serve national needs and preserve future resources. Efficiency requires a pragmatic sense of the necessary, and making sure priorities reflect economic and political realities, along with ecological needs.

A compelling case for investing in forest infrastructure—to secure water supplies and improve public safety—might borrow the calculus applied to transportation investments. Sad states of disrepair unfortunately may not on their own justify federal spending. Certainly many ecosystems are priorities based on current conditions, and how far habitats may have deviated from the past and the possible. However, we must ask the question of whether an initial expenditure will lead to durable solutions—whether a restored ecosystem will endure, or simply need repeated and expensive interventions. In some

National Interagency Fire Center/Kari Greer

places forests will just have to regrow in a condition and composition that we cannot currently prescribe. We also must be realistic about whether the markets needed to support restoration will be sustainable, and if not, whether the workforce and the infrastructure are mobile.

Mapping and analyses of fire-risk, forest reforestation needs, watershed conditions, and many other priorities are sophisticated and up-to-date. Less sophisticated is the understanding of what would happen otherwise, and whether one place or priority will have better returns than another. We need to invest in our forest infrastructure for all that it provides, but do so with a sense of what the return on that investment will be, and whether it is an efficient and responsible use of nature's resources as well as our own.

—*Will Price*

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A Vision for Conservation in the West: Field Notes from a Strategic Convening

Brian Kittler

> "...the problems we face require a culture of compromise and experimentation, and making use of policy and finance to work across multiple levels of governance."

Introduction

Following the 2016 elections the Pinchot Institute convened conservation leaders to examine potential solutions to persistent challenges facing landscapes in the Western U.S. The articles in this edition of *The Pinchot Letter* are inspired by this convening, with many insights from the event embedded throughout. The problems addressed are among the most pernicious in conservation, transcending the ebb and flow of political tides.

Our biggest conservation challenges cannot be solved by any one national policy, administrative rule, or any particular Presidential administration or Congress. Rather, the problems we face require a culture of compromise and experimentation, and making use of policy and finance to work across multiple levels of governance. Encouragingly, emerging paradigms in collaborative conservation now being applied across the public-private tapestry that is the American West are doing exactly this.

Themes from the Dialogue — Diagnosing Conservation Threats and Opportunities

Unconstrained development is a leading driver of ecosystem degradation. As we move toward the middle of this century two effects of growth bear special consideration — expansion of housing and other structures into wildlands and the expanding footprint of energy extraction, production, and transmission.

The number of homes and the infrastructure at risk of wildfire continues to grow, pressuring natural resources and the agencies managing them. Land-use policy is a pre-eminent example of the tension that exists in environmental policies grounded by federalism. Specifically, land-use decisions primarily made at the local level, are of national significance due to escalating state and federal expenditure on protecting structures in areas of high fire risk.

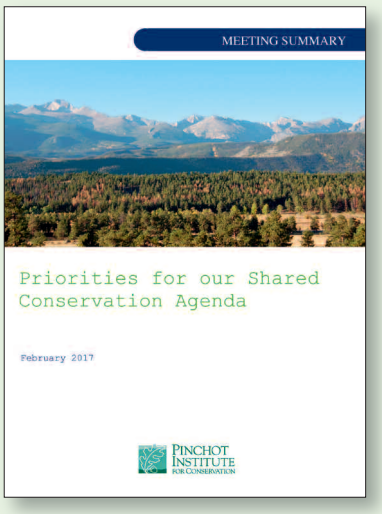
Continued expansion of low-density development into wildlands is largely unfettered across the West. Each new home makes fuel treatments and fire suppression all the more difficult and expensive, and actions presently taken to reduce forest fuels in the wildland-urban interface are inadequate when measured against the scale of the problem. The focus on homeowner education and technical assistance needs to continue, but a hard look at land-use policies and who pays for fire suppression is warranted.

The tentacles of sprawling energy infrastructure are reaching further and further across western forests and range, possibly impacting a land area the size of Texas between now and 2040.[1] Even this estimate may be on the low side as it does not factor in the potential for increased interest in expanding energy development on public lands. Setting aside the aspirations of the 115th Congress and the White House, changes in energy demand, distribution, and supply that were already in motion suggest renewable energy installations and fossil fuel extraction will expand substantially in the coming decades.

Much of the growth will occur in open space in the West where the resources are located, and where direct conflicts with people are more avoidable. Conflict over electricity transmission and pipeline proposals will

MEETING SUMMARY:

Priorities for Our Shared Conservation Agenda



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Brian Kittler.

Low-density development in the wildland urban interface near on the Front Range in Colorado.

continue. Mitigation procedures and smart planning are vital to avoid and minimize conflicts. Likewise, any calculation of the distribution of revenues from energy development on state and federal public lands must consider the long term costs of natural resource management and conservation across these lands.

As development in the wildland-urban interface and energy sprawl directly and indirectly stress large areas of public land, planning processes and agencies governing these lands, will increasingly need to address forces outside the management unit. For instance, as National Forests undertake Forest Plan revisions using the 2012 Planning Rule, lessons can be drawn from the landscape-scale thinking now permeating Landscape Conservation Cooperatives (LCCs). Ideally, such conservation planning processes are purposefully intertwined.

Similarly, moving from planning to implementation, as future project areas are mapped on Forests, state agencies, Resource Advisory Committees, Conservation Districts, and others, can lay the groundwork for complementary work off Forest. From fiduciary, ecological, and fire-management perspectives this modus operandi makes good sense. This way of working also helps facilitate the widespread and controlled reintroduction of fire into western landscapes.

These are just a few reasons why a shift towards all lands management (ALM) as an operational paradigm is underway. When implementing individual projects, agencies and landowners are increasingly emphasizing ALM to better deploy resources to problems that often fail to respect ownership boundaries. Supporting this approach, a number of policies have been introduced in recent years to facilitate projects across public and private

Brian Kittler

Monitoring of the Front Range Stewardship Contract, Colorado.

ownership. Prime examples are the Collaborative Forest Landscape Restoration (CFLR) Program, the Good Neighbor Authority, the Joint Chiefs Restoration Partnership, and the National Cohesive Wildland Fire Management Strategy, to name a few. These policies provide budgetary flexibility essential for ALM.

These policies also encourage leadership to emerge somewhat organically within ALM collaborative efforts from state, federal, and non-governmental entities — enabling resources to be placed on the ground more effectively. Moving forward into the next phase of ALM collaborative planning and implementation, a culture of experimentation could further promise new operational models, hopefully increasing cost-effectiveness. This will not necessarily require new or expanded authorities (although reauthorization of programs like the CFLR is important), but rather political will and social license for experimentation to occur.

Also vital to pilot testing of new policy concepts is improved outcome measuring and study of what is being learned. As has occurred with prior forays in policy experimentation, initiation need not be driven by Congress, rather as was the case with the Joint Chiefs Initiative and the origins of Stewardship End-Result Contracting, leadership can come from the field and administrators.

Given the combined impacts of climate change and the other threats of the Anthropocene, collaborative planning and implementation of natural resource management programs across all ownerships is likely the only viable path forward. Additionally, this needs to happen at scales matching "mega-disturbances" which increasingly stretch the mind and exhaust budgets.[2] Budgetary and structural implications for agencies are significant, as mega-disturbances are forcing something akin to a perpetual disaster-response mode. Given the history of conflict in natural resource management, particularly around salvage timber on federal public lands, how can we begin to approach consensus on mere principles for responding to changes as large as the drought-driven die-off of more than 100 million trees in the Sierra Nevada or the mortality of more than 800 million trees in Colorado? Answers come in part via the process of collaborating.

Conclusion

Finding durable solutions to conservation challenges equates on some levels to reframing the issue away from expenditure to investment.

At different stages in our national story we have invested in western lands in different ways as we sought different types of returns. For better or worse, the large water projects of the Bureau of Reclamation made cities in the desert a reality; post-World War II, timber from National Forests built many of the homes for the Greatest Generation to inhabit; and New Deal investments in

Don Graham CC BY-SA 2.0.

Landscapes across the West have been transformed by large scale mortality events.

the National Parks and National Forests laid the foundation for diverse recreation opportunities. So today, given the nature of our problems, what types of investments are needed and what returns should we expect?

For starters, investing in forest conservation and restoration can provide savings as evidenced in the emergence of water funds. This renewed focus on watershed investments in federal public lands recalls the whole reason these lands were conserved in the first place — to provide drinking water and to enable the development of human communities throughout the West. This foundational purpose still requires investment, but today innovative financing mechanisms can help. For instance, forest resiliency bonds are being tested and California's recent Assembly Bill 2480 allows for the same bonding mechanisms used to build and maintain pipes and aqueducts to also apply to key forested watersheds.

Likewise, programs to reintroduce fire to western lands can arguably be viewed as investments with the return coming in the form of reduced future expenditures in damage mitigation. What are the top restoration investments we should be making in the next decade to protect infrastructure like the Oroville dam in California?

Finally, the act of ecological restoration itself provides employment opportunities. In many cases forest restoration not only facilitates, but hinges directly upon new investment in sawmills and other wood processing infrastructure, which has economic ripple effects in rural communities. What lessons did we learn from the Great Recession and the American Recovery and Reinvestment Act? Rather than scrambling to find shovel-ready projects to stave off the most deleterious effects of a future economic downturn, perhaps we as a nation would be better served by building the resilient watersheds and landscapes of the future with strategic investments made today. The opportunity is right in front of us to build a regenerative economy, one that not only builds wealth and well-being but tackles some of the most critical problems facing conservation.

Brian Kittler is the director of the Pinchot Western Region office.

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A fly fisherman in Rocky Mountain National Park.

The Growing West

Jeffrey D. Kline

Several trends have been transforming the Western U.S. in recent years. Population in the West grew by 107 percent from 1970 to 2010, compared to 41 percent for the rest of the country.[1] With projections suggesting that by 2050 the U.S. could add another 120 million people,[2] western counties likely will continue absorbing some of that growth. These growth trends are presenting forest managers and policymakers with new challenges as more and more people are living in closer proximity to western forestlands.

Fundamentally, land-use change and development are caused by population growth, and influenced by incomes, public policies, and other socioeconomic factors. In the Pacific Northwest, for example, population has been growing — with a 76% increase in Washington and a 54% increase in Oregon since 1980. Much of this growth results from in-migration. As other states in the U.S. have experienced their own growth, many western states are viewed as desirable locations for people seeking to re-locate to places offering economic opportunities, less traffic, greater environmental amenities and opportunities for outdoor recreation, among other factors.

One consequence of these growth trends will be continued fragmentation and loss of forestlands. By one estimate, natural areas are disappearing at a rate equivalent to a football field every 2.5 minutes nationwide.[3] A second and related consequence is continued expansion of the wildland-urban interface, which is putting greater numbers of people and homes in proximity to remaining forestlands, and in the cross-hairs of increased wildfire risk brought about by fuel conditions and climate change.

The secondary consequences of current growth trends involve how remaining, more fragmented, private forestlands are managed. Nonindustrial private forest owners, in particular, often vary in their management objectives, with some favoring timber production, and others pursuing other nontimber interests. One study showed that in Oregon and Washington, for example, 20% of nonindustrial forest owners were solely interested in timber production, while 40% had recreation or other nontimber interests, and 40% had both

Figure 1: Population growth and development in Oregon and Washington

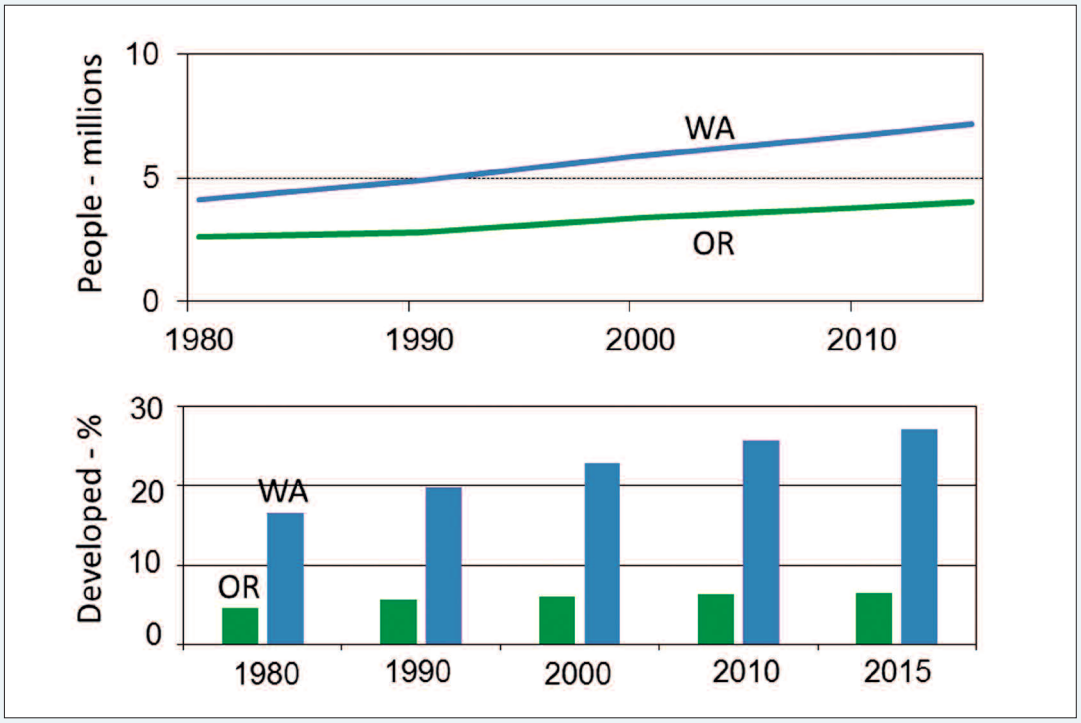
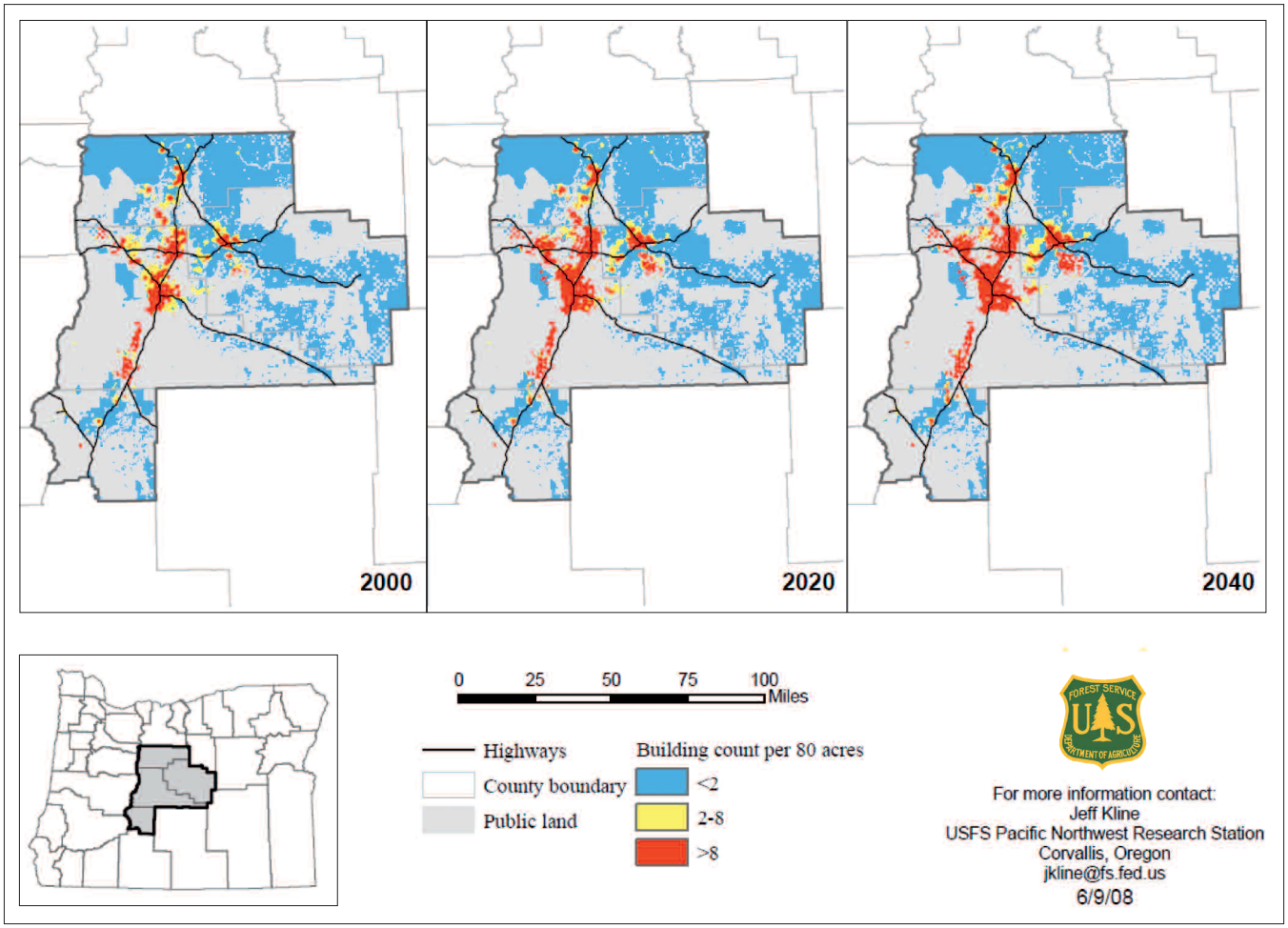


Figure 2: Predicted development for Bend, OR vicinity, 2000 to 2040



timber and nontimber interests.[4] Of forest owners who possessed exclusively recreation and other nontimber interests, they tended to own smaller forestland parcels—averaging about 50 acres compared to 105 acres for landowners having some timber interest—and nontimber owners were half as likely harvest.

One reason for this has to do with the economic viability of managing land to produce timber. Doing so favors larger land parcels over smaller land parcels. It likely also has to do with expectations and preferences of in-migrants purchasing those smaller parcels of land, which tend to lean toward securing forest amenities rather than timber production. Whatever the reason, as forest landscapes become more developed, and more fragmented into smaller and smaller land parcels, forest landowners collectively may evolve in their approach to forest management away from timber production and toward amenity protection and other nontimber interests.

The third outcome of population growth and development involves changes in public perceptions and preferences concerning forestland and other open space, and the influence these can have on public support for public policies to address development and related issues. Studies have examined the influ-

> "...people can be educated about natural resource issues and they can be persuaded to address issues such as their exposure to wildfire risk. The question is how best to do that if it has not happened already."

ence of development and loss of open space on public support for county referenda (or bond measures) to fund local open space protection.[5] Open space bond measures are increasingly more likely to be found in places where development has already reduced open space, such that as population and development increase, and open space becomes scarce, people become motivated to protect it.

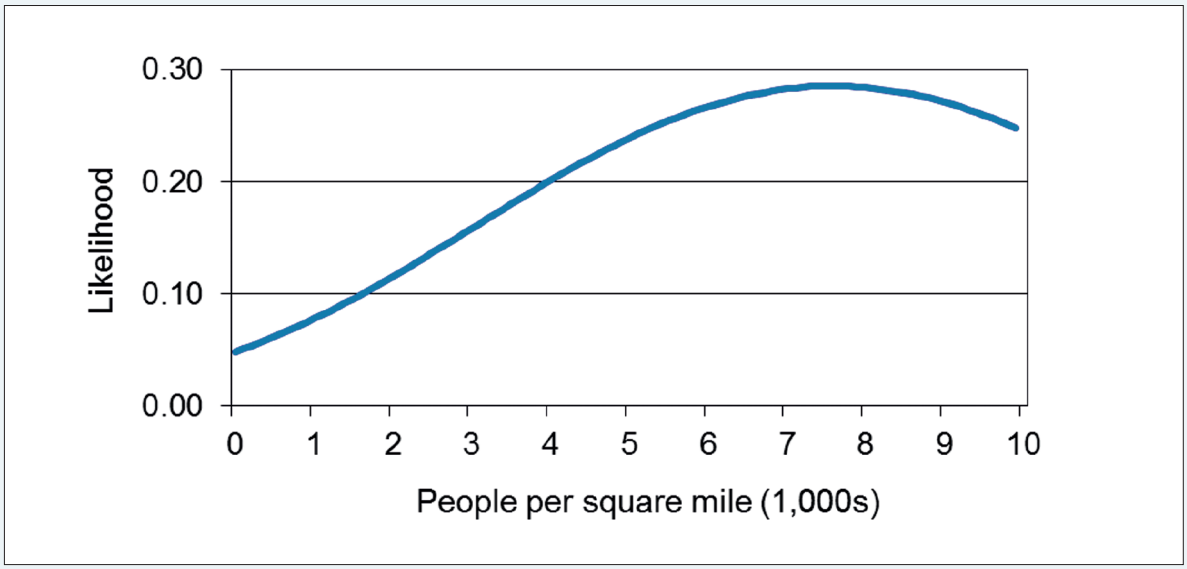
What this implies generally is that the public eventually responds to natural resource and conservation when they can see clear evidence of a problem or need. In the case of forestland conservation, much of the political support generally will be in more densely populated and even urban areas — among people who have witnessed themselves the implications of expanding development and a more fragmented landscape.

A similar process may be at work in how people respond to expansion of the wildland-urban interface and the associated wildfire risks to people and homes. Data from a study in central Oregon suggests that homeowners may be fairly savvy about the need to address wildfire risk, and may even be rather accepting of the risks they perceive in the region.[6] Seventy-seven percent of central Oregon homeowners conduct defensible space activities around their home to reduce their risk from wildfire. Rather than underestimating their risk, they may tend to overestimate risk, with 68% of homeowners believing a wildfire will occur near their home in the next five years, and 31% believing that such a wildfire likely will damage their home. Such numbers suggest that people can be educated about natural resource issues and they can be persuaded to address issues such as their exposure to wildfire risk. The question is how best to do that if it has not happened already.

For the most part, population growth is inevitable, and outside the influence of forest policymakers and managers. But forest policymakers and managers can influence the manner in which population growth shapes land-use change and development. Land-use policies, at both local and state levels, can be crafted to influence the pace and pattern of forestland development, and expansion of the wildland-urban interface. Public policies also can be crafted to influence how remaining forestlands are managed. For example, financial incentives, and education and technical assistance can be directed toward private forestland owners to assist them in managing remaining forestlands in ways that help to mitigate forest fragmentation, expansion of the wildland-urban interface, and increased wildfire risk. Education programs such as Firewise and assistance tools like the Fire Adapted Communities Network generally are viewed as successful, though as federally funded programs, they remain vulnerable to political trends and budget constraints.

The opportunities for addressing forestland development, fragmentation, and the expansion of the wildland-urban interface at varied governmental jurisdictions (e.g., local, state, federal) is a key factor behind the "all lands" approach to forest management envisioned by the USDA Forest Service. The approach seeks to supplement forest management activities on public lands with complementary activities on private lands, via incentives, education, and technical assistance targeting private landowners, among other policy meas-

Figure 3: Predicted likelihood of county open space referenda in the US



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Land management agencies use prescribed fire to help reduce wildfire risk to communities and municipal watersheds, to restore natural ecologic processes and functions, and to achieve integrated land-management objectives.

ures.[7] Such "cross-boundary" implementation of forest policy and management and the shared responsibility among local, state, and federal governmental jurisdictions and private landowners for addressing contemporary forest management issues is also embedded within the thinking that produced the "Cohesive Strategy" for fire management. The effectiveness of such a strategy in dealing with continued expansion of the wildland-urban interface is yet to be determined.

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Investing in Natural Infrastructure

Mary Mitsos and Marcus Selig

Introduction

Water is one of our most essential natural resources. Its scarcity shapes ecosystems and human infrastructure perhaps more than any other factor. Indeed, provision of water flows was foundational to the establishment of public lands, particularly National Forests. Now, with climate change and legacy management issues, more people are recognizing the critical role our public lands play in delivering our most precious resource. Yet, investments in the forests and watersheds where our drinking water is born remain relatively small. Although many of the programs designed to spur such watershed investments are nascent and few in number, some lessons learned are already beginning to emerge. This article discusses the rationales and needs for greater investment in watershed investment programs and provides two examples of successful models in the West.

Our Headwaters

As the nation's single largest source of fresh water, our National Forests provide water to more than 123 million people. Thousands of communities — including cities such as Denver, Atlanta and Los Angeles — depend on our National Forests for a reliable supply of high-quality water. Our forested watersheds reduce storm runoff, stabilize streambanks, shade surface water, cycle nutrients and filter pollutants — all important functions that contribute to high quality water downstream. In addition to local communities, American businesses have long benefitted from cold, clean and reliable sources of water to support their operations.

In recent years, our water supplies have been challenged by myriad factors including climate change, legacy management issues, and increased demand at the tap. As these pressures mount, there is increased attention to the roles of businesses in water stewardship.

The importance of public-private partnerships to improve our forested watersheds cannot be overstated. Federal, state, and local land managers are confronted with seemingly insurmountable challenges across tens of millions of acres of unhealthy and at risk forested landscapes. Using ever tightening agency budgets, land management agencies must find the means to address uncharacteristically severe wildfires, outbreaks of insects and disease, drought, and invasive species. To overcome this management conundrum, land managers are recognizing the need to rely more heavily on private partners to accomplish proactive forest restoration projects. Partnerships provide an opportunity to expedite and expand restoration using outside funding and collaborative working relationships.

Fortunately, water utilities, private corporations, and other downstream beneficiaries across the nation are also recognizing the value of investing in and supporting work to improve watershed health. Although the particular rationale for investment may vary among partners, the common factor for participation is improved water quality and long-term water certainty. Activities in headwater forests that reduce the risk of uncharacteristically severe wildfire, limit erosion and sedimentation, and improve wetlands and stream channels help ensure that reliable, high quality water arrives at downstream facilities.

The economic case for investing in the health of our forests and watershed is not difficult to make. Proactive watershed stewardship helps avoid costs associated with building new or repairing existing infrastructure or increasing water treatment activities, which may

National Forest Foundation

Proactive hand-thinning and piling activities on the Coconino National Forest supported through the Northern AZ Forest Fund.

otherwise be necessary to address the effects and consequences of an unhealthy watershed. For many investors, there is a long-term financial risk associated with *not* investing in watershed health. In particular, increasing water treatment requirements, decreased reservoir storage capacity, and loss of supply compels interests when rising costs can be directly attributed to business practices and bottom lines.

> "...the decision to invest is fairly easy. The more challenging question is often how and where to invest."

Receiving public recognition for investing in watershed restoration projects may also provide a strong incentive to partner with land managers. For many, the idea of improved environmental conditions is a "feel good" decision and makes sense from a personal level. With increasing consumer demand for businesses to make socially responsible decisions and set sustainability targets, many corporations are looking for ways to demonstrate their commitments to the environment. More and more are demonstrating that commitment through investment in watershed improvement projects.

Whether a business decides to invest in watershed improvement projects to help their bottom line, demonstrate their commitment to the environment, or just do the right thing, the decision to invest is fairly easy. The more challenging question is often how and where to invest.

Finding Solutions: The National Forest Foundation

One organization working with private investors on watershed stewardship is the National Forest Foundation (NFF). As the only non-governmental organization solely dedicated to enhancing our National Forest System lands, the NFF is well positioned to improve our forested headwaters. The organization brings a broad understanding of the threats facing National Forest, and knows effective ways to reduce those threats.

The NFF's signature *Our Forests, Our Water* program perpetuates America's great legacy of public lands through conservation of our most precious resource: water. The NFF works closely with the U.S. Forest Service and its network of local community partners to identify watershed improvement projects in high value watersheds across the country. Understanding the water footprint and interests of our partners, the organization ensures that these projects align with donors' water stewardship strategies. Below are a couple examples of how.

Restoring Burned Landscapes — Hayman Restoration Partnership

In June of 2002, the perfect conditions for a devastating fire converged in the forests near Denver, Colorado. For twenty days, the Hayman Fire raged through the Pike National Forest and neighboring lands, burning a total of 137,760 acres. The fire consumed 600 structures, jeopardized habitat for numerous wildlife 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.

National Forest Foundation

An example of the post-fire erosion the Hayman Restoration Partnership worked to prevent into Trail Creek, an important tributary of the South Platte River.

National Forest Foundation

Post-fire landscape following the Hayman Fire, demonstrating the lack of forest regrowth several years after the severe wildfire scorched soils and seedbeds.

Although natural recovery occurred across many acres, several drainages within the South Platte River watershed remained in significant need for restoration. Erosion is especially problematic in this area since it feeds sediment into one of the main sources of water for the Denver Metro area. 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.

The Trail Creek watershed, a critical sub-watershed of the Upper South Platte River, represented the highest priority for addressing sediment issues. Although the problems facing the Trail Creek watershed were clear, the solutions were not. Working collaboratively with the Forest Service and local partners, the NFF developed specific goals for restoration of the Trail Creek watershed and then worked with a diverse group of partners to accomplish these mutually-developed goals. Work across the project area included activities that were designed to restore degraded perennial streams and ephemeral stream channels, improve aquatic and terrestrial habitats, and reduce erosion and downstream sediment flow.

The NFF worked with old and new funders to raise the money needed to implement restoration projects. With instrumental leadership support from Colorado-based Vail Resorts, the NFF was able to garner additional support from national corporations such as Coca-Cola, dependent water utilities such as Aurora Water, and philanthropic giving from foundations such as the Gates Family Foundation. The community and funders truly rallied to repair this damaged landscape.

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

Keeping Our Watersheds Healthy — Northern Arizona Forest Fund

In 2014, the Salt River Project (SRP) and the NFF launched a program that provides an easy way for businesses, municipalities and residents of Arizona to invest in helping the lands and watersheds they depend on stay healthy. The Northern Arizona Forest Fund (NAFF) proactively addresses watershed health and provides a credible, reliable means for downstream beneficiaries to invest in watershed improvement activities.

Each year, the NFF works with the Forest Service to identify unfunded, high-priority watershed improvement projects on National Forests in the Salt and Verde River watersheds, which supply surface water supplies to the Phoenix metro area. All projects must be "shovel ready" and completely implementable in one year. Those projects are reviewed by a local advisory council that the selects the NAFF's annual projects. The suite of projects include activities that reduce wildfire risk, improve streams and wetlands, enhance wildlife habitat, restore native plants, and limit erosion and sediment into Arizona waterways.

Salt River Project

The Northern AZ Forest Fund is helping return low-intensity, more natural fire to the Coconino National Forest by supporting forest thinning and prescribed burning activities.

The NFF and SRP work hand-in-hand to raise funds from Arizona businesses, municipalities, foundations and individuals to support project implementation. Funds are held and managed by the NFF. On a regular basis, the NFF deploys funds to local nonprofit organizations, private contractors, and the U.S. Forest Service to complete the previously identified projects. Each year, program partners and contributors receive official reports detailing stewardship accomplishments associated with these projects.

The strong partnership between SRP and the NFF and the integrity of this approach to watershed investment has created significant success for the NAFF. In its first two years of operation, the NAFF completed eight high-priority restoration projects with tangible results on all five National Forests in northern Arizona and garnered over $2M in investments.

Conclusion

Although neither of these watershed investment examples may be directly replicable in other communities or watersheds, they both provide important lessons. Businesses and foundations understand the importance of watershed health and are investing. A well-respected, trusted investor and partner can catalyze greater investment. Effectively measuring and reporting on conservation outcomes and improved watershed conditions is necessary to continue to spur investments. Working together with our public land managers and nonprofit partners, we can make meaningful impacts that improve and repair our watersheds.

A former employee of the Pinchot Institute, Mary Mitsos is President of the National Forest Foundation.

Marcus Selig is the National Forest Foundation's Vice President of Field Programs.

Salt River Project

Bill Gamble

East Face ownership boundary: federal land (untreated) on one side, private land (treated) on the other.

The All Hands, All Lands Approach

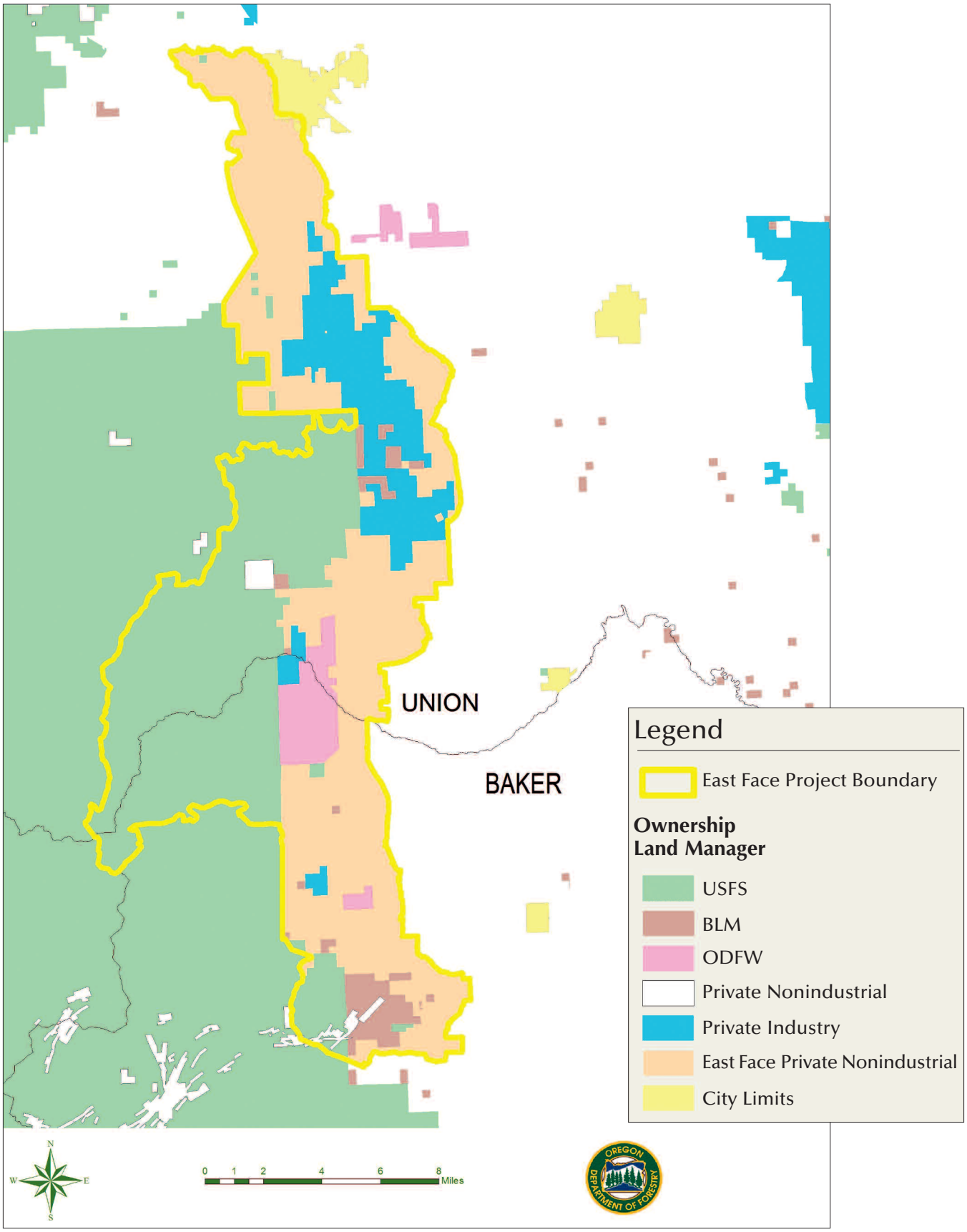
Susan Charnley

Over the last decade, the "all hands, all lands" approach has gained prominence as a means for restoring resilient forests and grasslands. Three central tenets of this approach are that forest management (1) on one ownership affects forest management on other ownerships in shared landscapes; (2) should therefore be addressed at the landscape scale and across land ownership boundaries; and (3) may be more effective if landowners, managers, and stakeholders collaborate to achieve common goals. The all hands, all lands approach seeks to leverage the resources and expertise of multiple landowners across multiple ownerships to promote restoration. A number of current policies and programs are promoting this approach, including the National Cohesive Wildland Fire Management Strategy, the Collaborative Forest Landscape Restoration program, the Forest Service-Natural Resources Conservation Service Chiefs' Joint Landscape Restoration Partnership, the Forest Service 2012 Planning Rule, and the Good Neighbor Authority.

When implemented on the ground, the all hands, all lands approach means that landowners, managers, and stakeholders having management interests in a shared landscape interact and make decisions about planning and/or implementing forest management activities to achieve common goals. A recent inventory of all lands projects to reduce the risk of wildland fire in Washington, Oregon, and California found that these projects take many forms, occur at many different scales, involve diverse land ownerships and participants, and entail anything from one-time restoration treatments to multiple treatments over several years, depending on the project. Thus, financial and technical assistance programs to support them, and authorities to enable them, call for diversity and flexibility. Federal and private family forest lands were commonly included in these projects; but very few included tribal lands, city or county lands, or private corporate forest lands. Government agencies often play a critical role in all lands projects, whether as initiators, leaders, coordinators, funders, or partners. Much of the success of all lands approaches hinges on building the relationships needed to undertake restoration collaboratively, and building the capacity to work across land ownerships over time (Charnley et al. 2017).

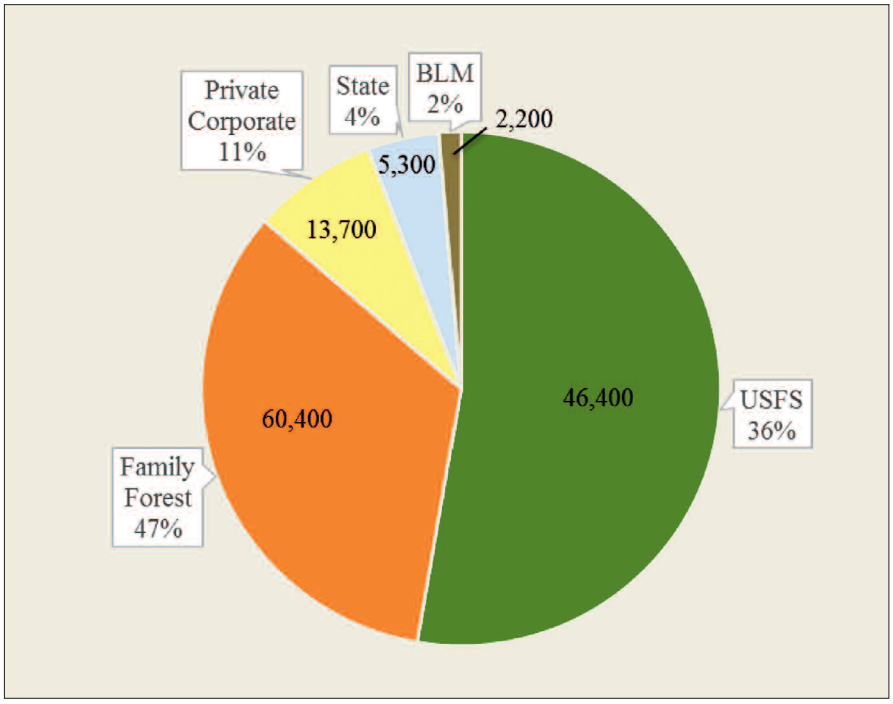
Where has the all hands, all lands approach been working well? The East Face of the Elkhorn Mountains project in northeastern Oregon is one example (Fig. 1). The East Face project was one of the first projects to receive funding through the Joint Chiefs' Landscape Restoration Partnership in 2014, and is also a National Cohesive Strategy pilot project. The goal of the Partnership is

Figure 1. The East Face Project Area



Jamie Knight, Oregon Department of Forestry

Figure 2. Landownership in the East Face Project Area (acres)



to promote an all lands approach to improving the health and resilience of forest ecosystems where public and private lands interface. The East Face project area is about 128,000 acres in size, and includes five different land ownership types (Fig. 2). The project is being implemented on all but the private corporate forest lands. Between fiscal years 2014 and 2016, the Forest Service received about $3.6 million and the Natural Resources Conservation Service (NRCS), about $2.6 million of Joint Chiefs funding. These funds have been used to plan and carry out forest restoration treatments to reduce the risk of wildfire on federal, state, and family forest lands.

The Forest Service and NRCS have coordinated with one another throughout the project, but have also worked closely with critical partners to design

Jana Peterson

Slashbuster treating private forest lands included in the East Face Project

Figure 3. Key partners working with the Forest Service to accomplish restoration treatments on federal, state, and private lands.

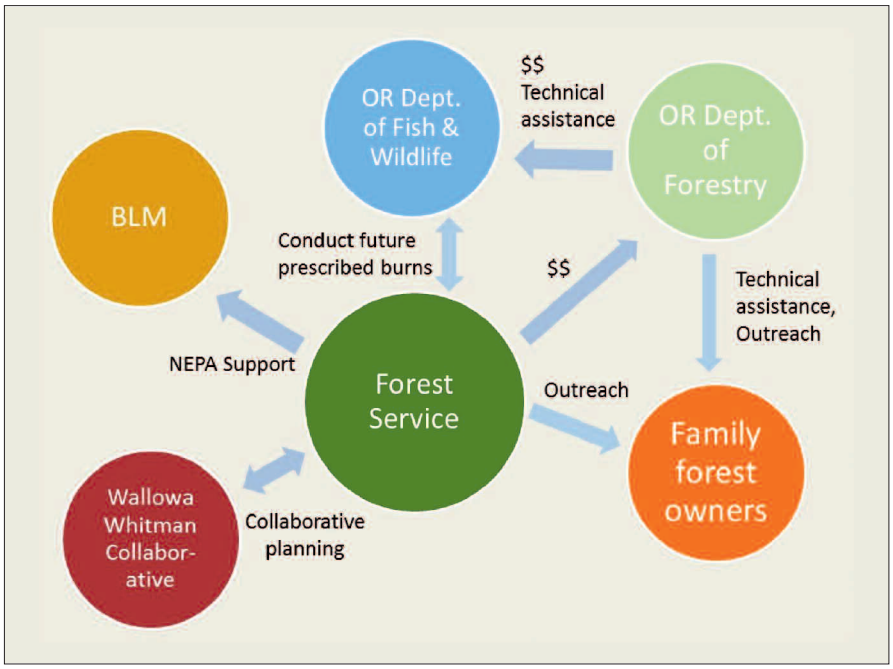
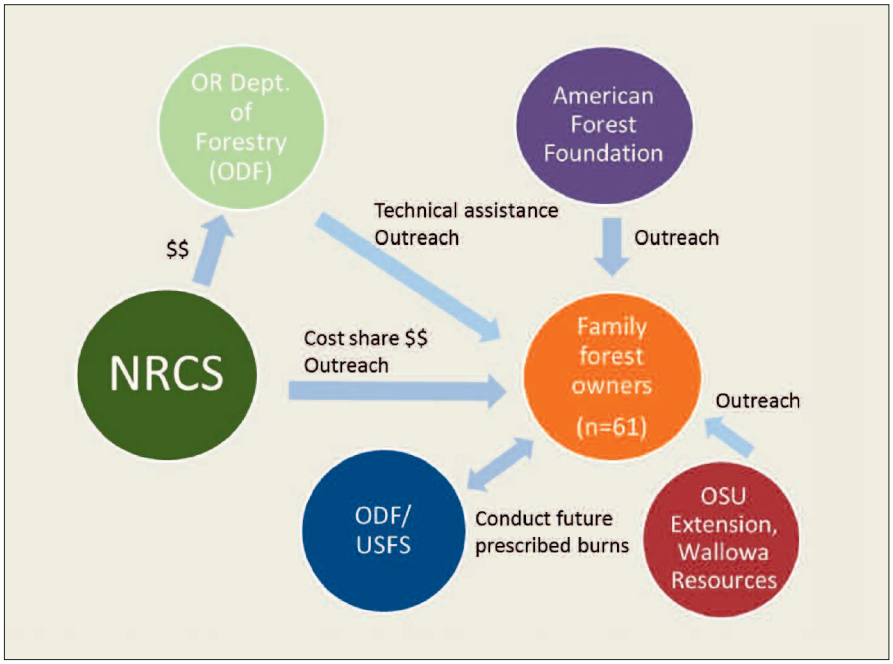


Figure 4. Key partners working with the Natural Resources Conservation Service to accomplish restoration treatments on family forest lands.



and facilitate implementation of fuels reduction treatments (Figures 3 and 4). The Forest Service worked with the local Wallowa Whitman Collaborative Group to plan treatments across 22,000 acres of the Wallowa Whitman National Forest, which they began implementing in 2016. The treatments will be concentrated along the Wallowa Whitman's shared boundary with private and state lands to reduce the risk of wildfire spreading from the national forest to other ownerships, and in wildland-urban interface areas. The agency also did the National Environmental Policy Act planning for treatments to be implemented by the Bureau of Land Management (BLM), though BLM will fund its own treatments. In addition, the Forest Service provided $751,000 of Joint Chiefs funding to the Oregon Department of Forestry (ODF) through its regional State and Private Forestry branch. There are no State Forests in the project area, but ODF has been a lead partner in the project. It used Forest Service funds for a number of activities, including education and outreach, funding counties to implement priority actions under their Community Wildfire Protection Plans, helping family forest owners prepare forest stewardship plans, and funding biomass utilization feasibility studies.

ODF also used Forest Service funding to plan and implement fuels reduction treatments on the Elkhorn Wildlife Management Area, managed by the Oregon Department of Fish and Wildlife (ODFW). These lands were badly in need of treatment to improve wildlife habitat and reduce wildfire risk to neighboring private landowners. Since acquiring it in the early 1970s, ODFW has had neither the money nor the staff expertise to carry out active forest management there. ODF provided forestry staff to plan one treatment that included 213 acres of commercial thinning on the Elkhorn, and three additional timber sales scheduled for the future. Initial treatment on ODFW lands occurred along their shared boundary with the Forest

Mark Jacques

Wallow Whitman Forest Collaborative Group tour of the East Face Project Area

Service; the Forest Service also plans to treat along this boundary. The agencies will then collaborate to conduct follow-up treatments using prescribed burns in the future under the Good Neighbor Authority. ODF also used Forest Service funding for non-commercial treatments on the Elkhorn, enabling ODFW to reinvest the initial timber sale revenues in preparing and implementing active forest management activities on four other wildlife management areas in eastern Oregon. ODFW has thus benefited from the East Face project in two important ways. First, it received seed money that led to a sustainable revenue source from timber sales that can be used to continue active forest management where needed to improve wildlife habitat and reduce fuel loads on wildlife management areas across eastern Oregon. Second, the East Face project caused ODF and ODFW to start working closely together as partners to accomplish restoration treatments — with ODF providing the technical forestry expertise and ODFW the fish and wildlife expertise. Timber sale revenues have also enabled ODF and ODFW to hire a shared forester who will continue to actively manage ODFW lands in eastern Oregon eight months out of the year.

The NRCS focus is on supporting fuels reduction on family forest lands. It provides cost-share money to landowners to pay for treatments (undertaken by contractors), but does not have technical forestry staff to help landowners plan treatments. Thus the NRCS partnered with ODF by providing East Face project funding to the agency to do this work (ODF has also contributed in-kind labor). ODF foresters have been central to implementing the East Face project on family forest lands. Outreach to encourage landowner participation was undertaken by a number of entities, including NRCS, ODF, the Forest Service, the American Forest Foundation — which used the opportunity to pilot test a new landowner outreach strategy and materials — Wallowa Resources, a local community-based organization, and Oregon State University Extension. Sixty-one landowners signed up for the project, with 5,492 total acres of mechanical treatments to be accomplished, some already complete. The Forest Service and ODF plan to collaborate in the future to implement follow-up prescribed burns on private lands. Landowners located along or near the boundary of Forest Service lands received priority for support in order to coordinate cross-boundary treatments with the agency, and reduce the potential spread of wildfire across ownerships. Although private landowners do not purposefully coordinate treatments with one another across their private land boundaries, they do share the same ODF forester, who takes into account the need for treatments that make sense across private lands. Another important outcome of the East Face Project has been creation of economic opportunities in local communities. The agencies report that nearly 264 jobs will result from project implementation associated with an estimated $9.2 million in wages, in addition to providing roughly 22 million board feet of wood to local mills.

What, then, makes the all hands, all lands approach successful? I have been working with two research collaborators from Humboldt State University, Dr. Erin Kelly and graduate student Jodie Pixley, to study other projects like East Face and learn what helps them succeed. This research is ongoing. Findings to date suggest a number of important ingredients:

- Federal policy direction and funding to support restoration on multiple land ownerships
- Partnerships to help leverage funding and resources
- Action by a large landowner (ie., Forest Service) to undertake treatments strategically designed to benefit other landowners, providing an incentive for neighbors to treat also
- Ability to think outside the box to get things done administratively
- Pre-existing relationships between partners
- Good working relationships between agencies, and agencies and other groups
- Intermediary organizations to help facilitate and provide capacity for doing the work
- One-stop shopping for private landowners (ie., NRCS/ODF partnership)
- Strong local outreach to private landowners
- Local business capacity for implementing treatments
- Strong community support
- Clear, consistent, frequent communication.

> "Much of the success of all lands approaches hinges on building the relationships needed to undertake restoration collaboratively, and building the capacity to work across land ownerships over time."

Additional research will shed more light on what the best incentives are for bringing diverse landowners together so that the benefits to them of participating in all lands projects outweigh the costs. Moving forward, it will be important to figure out how to better integrate best available science into all lands projects in order to strategically plan and implement restoration treatments across land ownerships that optimize desired outcomes. It will also be important to continue building administrative, financial, and political capacity to successfully carry out all hands, all lands approaches. Doing so is worthwhile because, as the East Face project illustrates, these projects can be successful at improving landscape-scale restoration efforts, providing restoration benefits to multiple landowners, building relationships, and creating economic opportunities in local communities.

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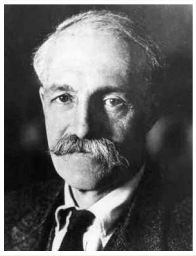
Continuing the Pinchot Legacy



"Conservation is the application of common sense, to common problems, for the common good."
— *Gifford Pinchot*

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Understanding and Managing Forests as Ecosystems:

A Reflection on 60 Years of Change, and A View to the Anthropocene

Jerry F. Franklin

There have been major revolutions in forestry, environmental affairs, and the wood products industry during my career. I was aware that things were changing and that I was participating in this process, but at the time I failed to appreciate the magnitude and direction of these changes in forest policy and management.

These past several years I have had to think deeply about the nature of these changes as my co-authors and I were completing a new textbook entitled "Ecological Forest Management."[1] The bottom line is that forestry is in an immensely different place and facing very different challenges than when I began my career 60+ years ago.

In this personal reflection I focus on three topics:

- First, how our view of forests has shifted from seeing them simply as collections of trees managed primarily to produce wood, to understanding them as complex, biologically-diverse ecosystems, which provide multiple ecological services and goods.
- Second, how this change in perspective has influenced forest policy, primarily but not exclusively on federal lands; this change is reflected in laws and regulations, as well as management plans. I will use the Northwest Forest Plan (NWFP) to illustrate the changes.
- Third, the challenges and opportunities provided by the arrival of the Anthropocene Epoch, which will certainly involve significant social changes as well as environmental. The social issues include highly polarized views about the meaning of the Anthropocene and how humankind should respond to it.

Forests as Ecosystems

When I was an undergraduate forestry student in the late 1950s, forests were viewed primarily as collections of trees and wood production as the primary object of forest management. Furthermore, the wood products industry was dominated by vertically-integrated corporations, which managed the most productive of our nation's forest estate to provide raw materials for their mills.

Natural resource managers at that time had similar views of their missions. Foresters focused on wood production and developing optimal agronomically-

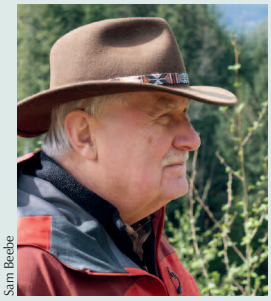
based approaches for efficiently doing that. Wildlife managers focused on production of game species and a major tool was elimination of predators.[2] Fisheries managers focused on commercial and sport fisheries; in their view every accessible body of water should be stocked with game fish, with no thought to impacts on other aquatic biota, including native fish.

There was no scientific basis at that time for any other perspective, even if a manager had wished to consider others. There was no body of ecosystem science to learn from or draw upon. Although much forest research had been conducted it was directed nearly exclusively to the goals of growing, harvesting and regenerating even-aged collections of young trees of commercially important species.

Today a large body of knowledge about forests as ecosystems does exist; it is a product of research conducted over the last 60 years much of it supported by the National Science Foundation, which supported the first generation of old-growth forest studies. They were extremely productive of important fundamental and practically relevant knowledge, identifying and documenting the complex structural features and functional capabilities of older natural forests. These pioneering studies were followed by many decades of additional research that dove deeply into structure (e.g., dead wood), processes (productivity), responses to disturbances (Mt. St. Helens), and ecosystem dynamics.[3]

Emergence of Ecosystem Concept in Policy

In the 1960s ecosystem concepts were emerging into popular conscience even if not recognized precisely by that label as environmental issues emerged as a major social concern. This was certainly stimulated by the book, "Silent Spring."[4] There was a growing appreciation of that all things were ultimately connected!


Sam Beebe

"...forestry is in an immensely different place and facing very different challenges than when I began my career 60+ years ago."

The legislative consequences of this emerging awareness are obvious, with several laws passed that were relevant to forest policy: the National Environmental Policy Act (NEPA), the Endangered Species Act (ESA), and the National Forest Management Act (NFMA). These laws made adoption of an ecosystem perspective imperative in managing federal lands.[5]

Society at large responded to the lessons of emerging ecosystem science more quickly than resource professionals, whose fundamental management premises were challenged by both the science and the laws. Much judicial intervention occurred before the full implications of these laws were realized and the Northwest Forest Plan (NWFP) was one of the defining outcomes of that legal jousting.

The Northwest Forest Plan

Determining the substantive requirements of ESA and NFMA ultimately involved legal challenges in federal courts. In the Pacific Northwest (PNW) an outcome was the suspension of further timber harvest activities on federal forest lands within the range of the northern spotted owl (NSO) in 1990. This set the stage for the NWFP in which the consequences of both science and policy were realized. As the most important federal forest region, a crisis was created that was ultimately addressed by newly elected President Bill Clinton in 1993.

Circumstances were challenging. The management agencies had lost credibility and a team of scientists (Forest Ecosystem Management Assessment Team or FEMAT) was given responsibility for analyzing the science and preparing alternatives for a subsequent NEPA-based EIS. President Clinton directed that all alternatives provided to him be scientifically sound and legal under existing law—the substantive outcome required by NFMA and ESA[6]—in addition to providing a predictable and sustainable timber sale program. Notably, FEMAT was conducted as a closed rather than a publicly open process.

The existence of a substantial and current body of science was fortuitous. This science was focused on the natural forests of the region and associated streams and rivers, as well as on the ecology of focal species, such as the northern spotted owl. Further, the scientific community was prepared to grapple with issues at this scale because of several earlier scientific analyses: the Thomas Report on a scientifically credible plan for conservation of NSOs[7]; and the "Gang of Four" report[8] commissioned by two Congressional committees and—at their request—focused on conservation of old-growth forests and endangered fish stocks as well as NSOs.

The NWFP revolutionized management priorities for federal forests, shifting the focus from timber production to ecological goals. It stopped

"Society at large responded to the lessons of emerging ecosystem science more quickly than resource professionals, whose fundamental management premises were challenged by both the science and the laws."

timber harvesting in most remaining older forests and planned for restoration of large contiguous blocks of older forest habitat (Late Successional Reserves or LSRs). The NWFP recognized the essential linkages between forests and streams and included multiple strategies to retain and restore aquatic environments. FEMAT adopted a coarse-filter ecosystem-based approach to conserving biodiversity. FEMAT emphasized the need for flexible, adaptive management and creation of a network of Adaptive Management Areas where experiments could be undertaken.

The NWFP achieved much but also failed regarding key goals. For example it did not result in recovery of the NSO and primarily because of competition from the invasive barred owl. The NWFP has not been as adaptive as planned because agencies and stakeholders ultimately wanted certainty in terms of outcomes, such as land allocations and prescriptions, not the uncertainty implicit in adaptive management. The predicted levels of timber harvest have not occurred, partially because the coarse-filter strategy central to FEMAT was subverted by addition of Survey and Manage, a fine-filter screen for 427 species.

Importantly the NWFP did not mandate restoration of ecosystem integrity, including the array of successional stages needed to sustain the biodiversity and processes of PNW forest landscapes. Active management was permitted but not emphasized, excepting thinning of young stands in LSRs to speed their structural development. The NWFP did allow managers to undertake restoration of dry (frequent-fire) forest ecosystems in LSRs to more natural and resilient conditions but few managers chose to do so.

The NWFP immediately began undergoing change but primarily through internal decisions that were opaque to the public. For example, logging of older forests in the general management land allocation (Matrix) —a key element in the NWFP—was halted almost immediately by civil disobedience and legal challenges. Management agencies ultimately ceased attempting regeneration harvests in any age of forest and confined timber harvesting to thinning of younger stands.

Recently the NWFP has undergone significant change through publicly vetted processes conducted by the U.S. Fish and Wildlife Service (USFWS) and Bureau of Land Management (BLM). The USFWS developed and adopted a recovery plan and designation of critical habitat for the NSO.[9] The BLM developed and adopted new management plans for the O&C lands in western Oregon.[10]

The NWFP still needs significant revision to reflect changed realities and additional knowledge.[11] One major need is to fully embrace the goals of restoring the integrity of ecosystems in both the moist forest (forests historically subject to wildfires with stand-replacement severity) and dry dorest (forests historically subject to frequent, low-severity wildfires) landscapes of the PNW.[12]

Systematically planning to sustain well-distributed high-quality early successional or preforest ecosystems is the most important need in Moist Forest landscapes. It has become clear that much of the biodiversity associated with these landscapes occurs in the preforest ecosystems following disturbances.[13] A revised NWFP needs a strategy for maintaining these disappearing habitats, primarily by variable-retention harvests in the immense acreage of existing plantations.[14]

The challenging task of restoring and maintaining resilient forest conditions in the dry forests needs to be aggressively embraced in a revised NWFP.[15] A generic policy of retaining old trees is an appropriate principle in restoration because of their ecological and social significance.

The recovery plan for the NSO[16] provides an excellent starting point for incorporating both the restorative moist and dry forest activities. Furthermore, both of these restorative efforts would be important contributions to preparing and adapting the federal forests to the expected effects of climatic change.

A key lesson we have learned about managing forests as ecosystems is that attempting to maximize management for any individual output will result in the marginalization or elimination of other important functions. Today on public lands we have largely moved beyond the notion that wood production is the overriding goal of forest management and other uses and values are merely by-products. Now proponents of other forest values—such as maximizing carbon sequestration—need to embrace the same difficult lesson. Managing forest to optimize any single function, condition, or species will result in marginalization or complete loss of other important ecosystem capacities; it will violate the principle of managing so as to maintain the fundamental integrity of the forest ecosystem. Natural forest ecosystems—our models for sustainable management—provide multiple values but maximize none.

Challenges of the 21st Century: The Anthropocene

So what does all of this have to do with the Anthropocene? A lot, as it turns out. There is a growing need for ecosystem-based active management to restore ecosystem structure and function, create resilient forests and landscapes, provide economic and other social benefits, and create novel solutions when ecosystems undergo failure.

In one sense the Anthropocene simply labels a reality that human influences are now pervasive and generating global-level changes both directly and indirectly.

What the Anthropocene *should* make apparent are humankind's responsibilities for sustaining the functional capabilities and biological diversity of the global ecosystems for their future potential as well as their current contributions to humankind. The challenges of maintaining ecological integrity, let alone species, is going to be immense, as is the critical need of providing for economic and other societal values. Ecosystem science will be one of the major sources of knowledge that we are going to need in order to do that.

But we are faced—yet again—with significant social challenges, including some folks with pretty extreme perspectives about how we ought to proceed! As usual, achieving social consensus is likely to be a greater challenge than the scientific and technical issues.

On one side there are those who believe "nature is dead" or at least irrelevant. They think that since we are now in the Anthropocene and humans are recognized as the dominant influence on global conditions and since truly natural ecosystems no longer exist, nature, natural models, and natural science are all irrelevant. Solutions to problems will be technical and human-created—we will bioengineer our way out of any problems of food, fiber, and everything else.

Editor's note: This article is based on the 2016 Pinchot Distinguished Lecture given by Jerry Franklin. Dr. Franklin was awarded the Pinchot Medallion in recognition of his extraordinary contributions to the science and practice of ecologically-sound forest management, and to major advances in our knowledge of the structure and functioning of old-growth forest ecosystems.

Institute President Will Price (left) awarded the Pinchot Medallion to Dr. Franklin with Nick Niles (right), Chair of the Institute's Board of Directors.

"A key lesson we have learned about managing forests as ecosystems is that attempting to maximize management for any individual output will result in the marginalization or elimination of other important functions.... Natural forest ecosystems—our models for sustainable management—provide multiple values but maximize none."

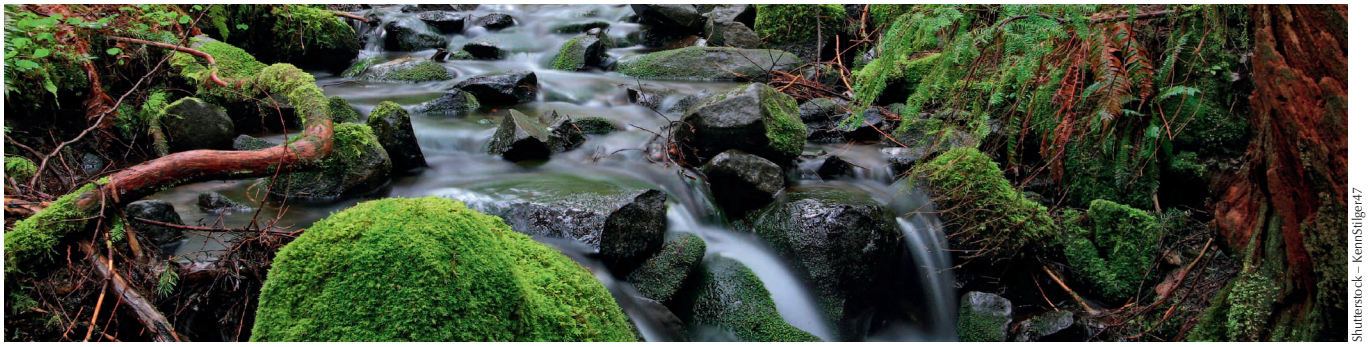
On the other side are individuals and organizations that would ignore our scientific knowledge in favor of passively leaving solutions to Nature. Their mantra is, "You foresters (and other natural resource managers) have screwed everything up. You need to stay out of the forest and let Nature restore the balance!" Seemingly, some would rather allow forests to burn catastrophically than see resilient conditions restored through application of established science.

This is illogical. Take the example of the frequent-fire forests, which under historical conditions rarely experienced stand-replacement fires. Human activities have altered all aspects of these ecosystems from their structure and composition to the environment within which they exist. Left on her own, Nature will respond to these altered conditions but the outcomes are likely to be undesirable from the standpoint of human values, including maintenance of the ecological integrity of the forest. We have accumulated significant scientific understanding and practical experience in the restoration of such forests and landscapes. Why would we not use our knowledge in collaborations with Nature so as to restore a more resilient (and natural) condition to the advantage of both the forest and society?

Nature—natural science—is not just relevant in the Anthropocene; in fact it will be essential to our succeeding in efforts to deal with environmental change. *Recognition of the Anthropocene can, in fact, be seen as an opportunity—indeed an imperative—to undertake a new partnership between Humankind and Nature.* In this partnership Humankind utilizes its scientific knowledge and significant powers to assist Nature to the advantage of both society and the ecosystems on which it depends.

Understanding forests as ecosystems provides us with the essential basis for managing forests for multiple-uses. This was the most important development in forest science, policy, and management in the 20th century. Using this knowledge will be essential as we address the unforeseen and largely unforeseeable challenges of forest conservation in the Anthropocene.

Dr. Jerry F. Franklin has spent more than 50 years studying forest ecology, primarily in the Pacific Northwest. He has been a researcher for the USDA Forest Service, and at Oregon State University and the University of Washington. He is considered one of the country's leading authorities on sustainable forest management, and he is often called the "father of new forestry."



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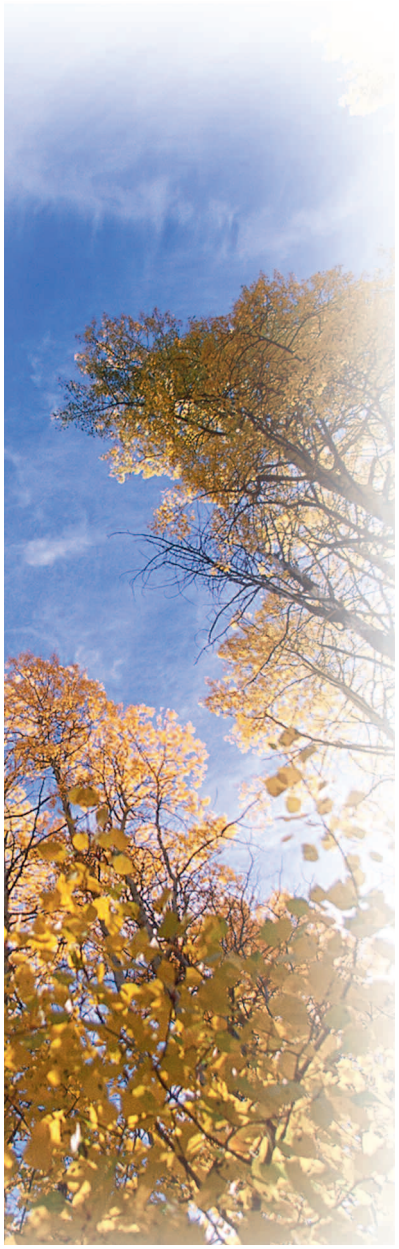


"We have accumulated significant scientific understanding and practical experience in the restoration of such forests and landscapes. Why would we not use our knowledge in collaborations with Nature so as to restore a more resilient (and natural) condition to the advantage of both the forest and society?"

Working across All Lands: The "Holy Grail" of Land Management?

Rachel Plawecki

Salmon Valley Stewardship

Bob Christensen enjoys a challenge. In his Southeast Alaska home of Icy Strait, severe weather is so common that all plans he makes are "weather permitting." His morning commute to Hoonah, a small village on an island near Icy Strait, involves taking a boat or small plane. Weather permitting, of course. As Christensen put it, "Pretty much everything you do here involves adapting to Mother Nature."

For thousands of years, southeast Alaska has been home to the Tlingit people. Because of this strong native Alaskan presence, as well as the city's isolated location, the community relies on local land and water for everything from food and commerce to traditional cultural practices.

"I like to think of a cash economy and a wild food economy, both, when I'm thinking about land management projects — especially in the native villages, but really throughout the region," Christensen said. To this day traditional subsistence practices like hunting, fishing, and berry-picking are thriving in the area. Historically, salmon fishing, timber, and mining production ruled the cash economy, but booms and busts in those markets have opened the door for commercial fisheries, tourism, and non-timber forest products.

Christensen's latest challenge is to find a sustainable blend of these cash and subsistence economies—to grow the natural resource economy while preserving native traditions. He and his team at the Sustainable Southeast Partnership are in search of what he calls "the Holy Grail of land management."

Their quest is exemplified in an innovative project called the Hoonah Native Forest Partnership, a science-based, landscape scale, community forest approach to watershed planning and project implementation. The project has brought together a diverse set of partners, including native corporations, government agencies, and conservation groups.

The HNFP project area is approximately 150,000 acres covering all complete watersheds within which Regional Native Corporation (Sealaska) and Village Corporation (Huna Totem) lands exist, including almost 90,000 acres of federal lands. Earlier this year, project administrators hired six local residents to complete the area's first comprehensive and consistent natural resource inventory. The data will inform next year's pilot projects, which will include forest thinning that blends timber and wildlife habitat values, forest management activities designed to enhance berry production, and road work that improves tourism and access to wild food gathering locations.

In the end the Partnership hopes that by scaling up their pilot projects, they will achieve "a measurable and resilient blend of timber, salmon and deer production, local economic diversification and improved watershed health," all while supporting the native heritage that makes this place so unique.

1500 miles away Gina Knudson is taking a similar approach in the much drier landscape of Salmon, Idaho. She and her team at the Lemhi Forest Restoration Group (LFRG), a collaborative group coordinated by Salmon Valley Stewardship, face the conundrum of simultaneously addressing community wildfire protection, forest health, and economic growth in a county of over 90 percent public land. Landscape scale stewardship is LFRG's solution to this integrated set of challenges, and the Hughes Creek project is proof that their approach works.

The Hughes Creek project area consisted of slivers of private land adjacent to the Creek, and the surrounding lands managed by the Salmon-Challis National Forest. The entire area is extremely fire prone, so LFRG's top priority going into the project was community wildfire protection.

A broad group of community members, elected officials, conservation groups, and business interests looked at the Hughes Creek watershed with an eye toward efficiency and cooperation. Hazardous fuels treatments happened on National Forest and private lands, including a narrow strip of about 600 acres surrounded by public land and owned by an out-of-state mining interest.

"Without treating the private land, the treatments on the surrounding public lands wouldn't have been effective. The county and other collaborative members worked for months to engage the property owners, and Idaho Department of Lands designed a prescription that mirrored that on the neighboring Forest Service land," Knudson said.

As difficult as it is to fathom, the Chinook salmon and steelhead that are so abundant in the Hoonah landscape are just trying to re-establish a viable population in Central Idaho. The Lemhi collaborative wondered whether the Hughes Creek project could also improve habitat for these threatened and endangered species in addition to reducing wildfire risk to people. Salmon-Challis National Forest fisheries biologists concluded that the lower reach of the creek, partially flowing through private lands, had been seriously altered by placer mining in the early part of the century.

"So one of our collaborative members approached a young ranch family who owned this beautiful pasture with about a one-mile segment of Hughes Creek flowing through it....They agreed to let us put logs in the creek as part of a stream restoration project, and the Forest is now recording Chinook in the watershed in reaches where they haven't been recorded for decades," Knudson said. The collaborative sponsored the project, raised all the funds, and had a big volunteer day when draft horses pulled the logs into Hughes Creek.

> "When we started thinking about what the watershed needed, instead of where the boundary markers were located, we were able to achieve better outcomes."

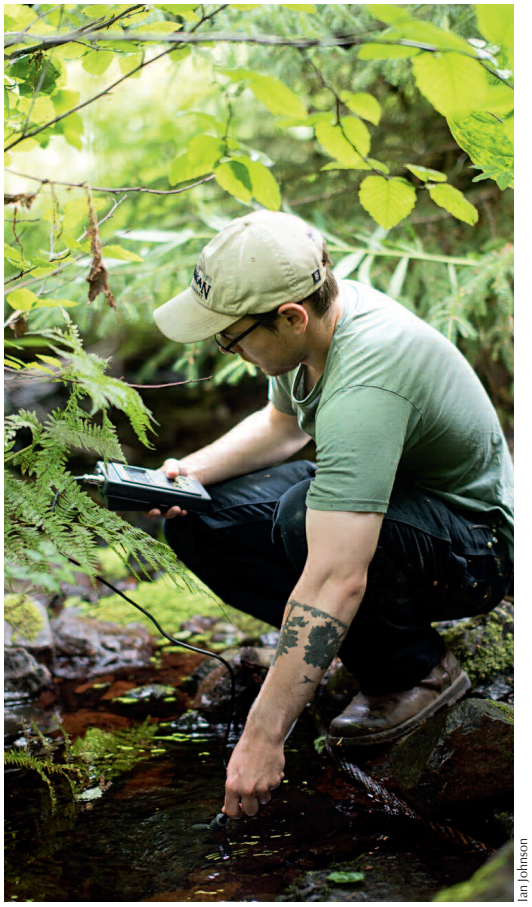
"Under the old way of doing business, that project would not have happened. When we started thinking about what the watershed needed, instead of where the boundary markers were located, we were able to achieve better outcomes."

There is a new name for this approach to collaborative land management emerging across the West: "All Lands, All Hands." Natural resource management across All Lands involves multiple parties who rely on neighboring land parcels for economic, social, and ecological values. The parties identify common interests that cut across ownership boundaries and pool their resources to conduct collaborative restoration and stewardship activities.

So, why All Lands? Natural processes like fire, insect and disease outbreaks, and wildlife movement, operate without regard for the private and public land boundaries drawn on maps. Likewise, human relationships and economic markets operate across all lands. This approach to collaborative stewardship recognizes the interdependence that exists regardless of property and management boundaries.

The crux of the All Lands approach is this: we can accomplish more together than we can alone. By pooling our resources and working at broader scales, we can achieve more durable outcomes on the ground and create jobs at a scale that is meaningful for long-term workforce development. These things are critical if we aim to use stewardship to increase both natural resource and community well-being.

While an All Lands approach to land management may not be the cure-all for the rural West's macroeconomic challenges, it does empower rural communities to plan holistically for their future and strengthens the social fiber within and across communities. As more collaborative efforts graduate to



Ian Johnson

the All Lands approach, they are setting a new standard for achieving long-term ecological and economic solutions backed by social agreement and joint investment.

By working across multiple land ownerships, an All Lands approach allows land managers to address ecological issues at the scales on which they operate. Not only can managers do more work on more land, but they can also coordinate across boundaries to make sure work is done strategically.

"In Hoonah," Christensen said, "we did what no one else had before. We did a comprehensive inventory of forest structure, and now all the landowners have the same data to work with. We did it with a single crew, a single pot of money, and in a single summer. This was much more efficient than if Village Corporation did one, then the Forest Service did one, and so on."

This approach naturally appeals to a wide range of partners, leading to pooled and leveraged investment and more work done on the ground. HNFP was initially funded by the USDA Natural Resource Conservation Service (NRCS) Regional Conservation Partnership Program, which paved the way for further investment from other partners, including the Forest Service, The Nature Conservancy (TNC), and Huna Totem. "This gets people's attention at all levels," noted Christensen.

Knudson points out that more work on the ground can mean higher community benefit. That was the case in the Hughes Creek project. Thanks to a stewardship agreement the Salmon-Challis entered into with the Rocky Mountain Elk Foundation, a local hunting outfitter cross-trained his wilderness crew into a hard-working hazardous fuels reduction crew.

"I think Bighorn Outfitters only ended up doing about 100 acres of thinning and piling on Hughes Creek. But that kept a seasonal work crew of about seven people working during the typically slower summer months. So you have workers who are sticking around for the majority of the year, renting houses and keeping their kids in a school that faces declining numbers, and the Forest Service is getting the benefit of the outfitters' free and heartfelt publicity."

In both Hoonah and Salmon, there is a history of conflict around natural resource issues. The partnerships described in both cases probably would not have happened just a few decades ago. But working across ownerships and sectors develops relationships based on mutual trust, respect, and understanding. "My hope is that through the [HNFP] project, we'll be able to heal some of those old wounds," Christensen said.

These relationships are critical for collaboration to produce the returns on investment that rural communities need. The momentum, optimism, and relationships built through projects like these will translate into more effective management of our public and private lands.

Work crews conduct a deer pellet survey to help understand the relationship between pre-commercial thinning, slash variability, and deer abundance.

Ian Johnson

Salmon Valley Stewardship

For this approach to work at scale, the conservation community will need to connect and learn from the Hoonah's and Salmon's of the world—the innovators who have been experimenting and finding success for over a decade. Building capacity for replication in the rural West will continue to be essential for realizing success with the All Lands, All Hands strategy. What is more, it will be vital that these lessons and stories make their way to Capitol Hill to inform and encourage policies that enable good work on the ground.

Knudson and Christensen are working on that front too. They are both on the Leadership Team of the Rural Voices for Conservation Coalition (RVCC), a unique network of local, regional, and national groups tackling the tough ecological and economic challenges facing isolated rural communities across the West. For the last 15 years RVCC has brought the voices of these communities to Washington, DC and has served as a network for practitioners.

"Soon after finding my realm of community forestry," Christensen said, "I found my way to RVCC and immediately benefited greatly from learning about projects happening all across the West. It's helped me see a bigger vision for what I've stumbled into and given me courage to do what looked like a daunting task."

Over the next year, RVCC will be formalizing the learning exchanges within their network, and taking a more intentional look at leadership development in rural communities. They will be encouraging the use of the All Lands approach by building relationships across landscapes and relaying lessons learned to policy makers. Stories like Christensen's and Knudson's will certainly be told again.

Rachel Plawecki is a legislative aide to Michigan State Representative Darrin Carmilleri. She previously worked for Wallowa Resources and Sustainable Northwest in Oregon.

INSIDE THE INSTITUTE

Announcing Two New Conservation Fellows

During their one-year appointments, Pinchot Institute Conservation Fellows collaborate with other researchers and policy specialists within and outside the Institute to identify, develop, and test new policies and business models for solving the complex conservation challenges of the 21st century. Conservation Fellows are often recent graduates of masters programs pursuing the next step in their careers through work that allows them to apply their passion and expertise to the cause of conservation.

Based in the Portland, OR Western Regional Office, **Josh Fain** is working to find creative conservation solutions that address the financial challenges of family working lands and build landscape scale climate resilience. Before coming to the Institute, he spent 12 years working with the U.S. Forest Service in a variety of positions ranging from fire management to climate change research. Most recently Josh helped start the USDA's Caribbean Climate Hub in San Juan, Puerto Rico, working to coordinate federal, state, and NGO efforts around climate change adaptation in agriculture and forestry. He recently published a study entitled "Climate Change and Coffee" that employed downscaled climate data to model the potential impacts of climate change on coffee growth in Puerto Rico. He has also written and co-authored several other publications on climate vulnerability in working lands and is a co-author of the upcoming fourth national climate assessment. Josh has a B.S. from the University of Georgia in Forest Resource Management and a Masters of Environmental Management from the Yale School of Forestry & Environmental Studies.

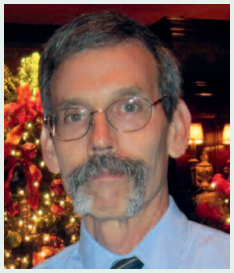
Eli Roberts is a forester from Connecticut who helps coordinate the Common Waters Partnership in the upper Delaware River Basin. He completed a Master of Forestry the Yale School of Forestry & Environmental Studies, where he concentrated on ecological forest management and agroforestry systems. His capstone project summarized the robust potential for expanding agroforestry in the northeastern U.S. Eli has been an elementary school teacher, landscape designer, vegetable grower, and part-time chestnut orchardist. His professional interests include working forests, environmental justice, conservation biocontrol, and cost-share programs. He likes riding his bike, collecting and planting seeds, and singing shape-note music. He also studied psychology at Villanova.

Institute Names Two New Senior Fellows

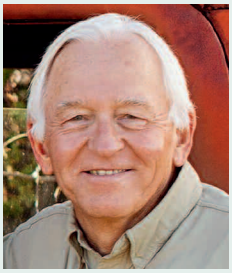
Pinchot Institute Senior Fellows contribute substantially to carrying out the work of the Pinchot Institute. Senior Fellows are appointed on the basis of their expertise in policy areas relevant to Pinchot Institute programs and priorities, and for their recognized accomplishments in their respective fields. Serving three-year renewable terms, the work of Pinchot Institute Senior Fellows is integrated with that of colleagues and staff at the Institute, and often provides a useful bridge between the Institute and a Senior Fellow's home organization at a university or other research institution.

Recently, a strategic area of growth in the Institute's corp of Senior Fellows is in the realm of public lands acquisitions, land exchanges, and right of ways, as evidenced by the exceptional capacity brought by our newest Senior Fellows Steve Rinella and Bob Dennee, both of whom join the Institute after concluding their careers in public service with the USDA Forest Service, the last phase of which was leading the agency's Lands and Realty Management Program.

Bob and Steve's expertise in the policies, programs, and procedures involved with exchanges and conveyances of lands into the public domain are integral to the continued success and conservation of these lands for the public interest. As Senior Fellows they will continue this work and help train the next generation of experts in this important field. This work is of increasing importance as the nation's energy, water, and telecommunications infrastructure increasingly originates from, or crosses through, our public lands. Demand for outdoor recreation will continue to grow as an increasingly urbanized society seeks quiet moments and a natural connection in a world where we find ourselves continually plugged in and online.



Steve Rinella brings extensive background in real property policy, management and law, following nearly 33 years with the USDA Forest Service. His background includes technical and managerial experience in South Dakota, Arizona, Idaho, Colorado, and Washington, D.C. He retired in 2015 as the Assistant Director of Lands and Realty Management. His experience includes real estate transactions, title issues, land uses, easements, and lands-related legislation and litigation. He holds a Bachelor of Science degree in forestry from Iowa State University. Throughout his career, he also satisfied his interest in wildfire management, and continues to, by serving as an Operations Section Chief with national incident management teams. He resides in Littleton, Colorado.



Bob Dennee has a lengthy track record of working effectively with landowners, agencies, and conservation partners to negotiate and develop successful conservation projects. In doing so, Bob spent much of his 40-plus-year career with the USDA Forest Service on the National Forests and Grasslands of Montana, Idaho, North Dakota, and South Dakota, with special assignments in Alaska and Washington, D.C., collaborating with public officials, federal and state agencies, conservation groups and landowners to complete more than 50 high-profile conservation and public access projects. Highlights include managing numerous land purchases and donations conserving more than 80,000 acres of critical private land and enabling the consolidation of more than 100,000 acres of public land. Bob lives in Bozeman, Montana.

INSIDE THE INSTITUTE

Three New Members Elected to Pinchot Institute Board of Directors

Richard Cole Anthony, a graduate of Denison University with a degree in history, was a commissioned officer in the U.S. Navy on active duty from 1967 through 1970. Starting in 1971 with The Hartford National Bank, Dick spent 30 years in the institutional fixed income investment arena as a bond portfolio manager, trader, underwriter, and sales executive. Dick retired in 2000 to pursue philanthropic and civic activities, including service on the board of the Weekapaug Foundation for Conservation and two terms as an elected town council member in Westerly, Rhode Island.

Elizabeth Cericola is development officer, individual giving, for World Wildlife Fund's Eastern regional philanthropy team. Beth joined WWF in January 2014 from The Pew Charitable Trusts, where she worked on donor communications and philanthropic partnerships for Pew's environment initiatives. Previously, she managed Rails-to-Trails Conservancy's major giving program. She has held internships at Worldwatch Institute and the Smithsonian Center for Folklife and Cultural Heritage. Currently, Beth serves on the Planning Committee for the Association of Fundraising Professionals D C Young Professional Affinity Group. She received a B.S.F.S. in culture and politics from Georgetown University's Walsh School of Foreign Service. Beth lives with her husband, Nick, in Washington, D.C.

Having spent the past 31 years in Europe and the Middle East, **Tamara Chant** recently returned to her native home of Milford, Pennsylvania to join her children and parents. A Smith College graduate, Tamara managed marketing and sponsorship for Top Marques Monaco, a luxury car and goods exhibitor, in Monaco and Abu Dhabi. Tamara began working with non-profit organizations after completing a certification in fundraising at NYU, shifting her focus toward activism for vulnerable populations. She was recently appointed Executive Director of Safe Haven of Pike County, a domestic violence and sexual assault resource agency. Tamara also serves as a board member for the Nepal Orphans Home and the Good Shepherd Child Care Center.