# Restoration Cases Flagship Collection

## Case #14

Restoring forests and public trust in Oregon, USA with the Ashland Forest Resiliency Project

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# Contents





# In brief

## Overview

In 2010, the Rogue River-Siskiyou National Forest, the City of Ashland, and two non-governmental organizations, Lomakatsi Restoration Project and The Nature Conservancy, formed a collaborative partnership and initiated the 10-year (extended to 15) Ashland Forest Resiliency Stewardship Project to reduce the threat of severe wildfires across the 6,353 ha (15,699 acre) watershed. Reducing high severity wildfire on public and private lands was key to protecting the community and the city's drinking water, and to sustaining forests that provide for diverse wildlife and resident's quality of life. A "shared stewardship" approach allowed the partners to leverage significant co-investment and capacity. In 2015, forest restoration programs were extended to private lands, increasing the project area from 8,900 to 21,400 ha (22,000 to 53,000 acres). Fuel reduction treatments extended to 5,868 ha (13,300 acres) and by 2018 covered 28% of the extended project area, with controlled underburning on 607 ha (1,500 acres).



## Exemplary practices

The project incorporated extensive community input from the outset and leveraged strengths of partners to sustain community support and co-investment. The Nature Conservancy led a collaborative, multi-party monitoring program that incorporated mentoring undergraduate and graduate students in watershed and forest research. The City of Ashland led community engagement efforts that emphasized transparency, learning, and dialogue to foster public trust. The City generated new funding to launch a "good fire" campaign in the watershed, engaging community members in workshops, watershed tours, public policy input, and coordinated smoke response. The Lomakatsi Restoration Project designed and supervised implementation of ecological thinning and prescribed fire. Lomakatsi also provided skilled forest restoration technicians and offered training and workforce development programs for adults and youth, including tribal members.

# Key lessons learned

- *Transparency and trust are at the heart of all-lands management, encompassing public and private lands.*
- *Restoration implementation needs to be flexible in response to changing environmental and social conditions.*
- *Strong collaborative arrangements are essential to identify constraints, build flexibility, and leverage strengths across partnerships.*
- *Clear and frequent communications with landowners and community help align project objectives with needs.*
- *Project funding needs to support restoration costs in addition to supporting a local workforce.*



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# Restoration narrative

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# Geography and ecological setting

The Ashland Watershed is located in the temperate and mountainous Siskiyou Mountains of the Klamath Mountains and California High North Coast Range Ecoregion (Omernik and Griffith, 2014), spanning the western side of the California-Oregon border in northwestern USA. The 6,353 ha (15,699 acre) watershed spans elevations from 890 to 2,296 masl, peaking at Mt. Ashland, the tallest point in the Siskiyou Mountains (Figure 1). The City of Ashland is uniquely integrated with the surrounding forest, containing 405 ha (1100 acres) of municipal forest, and is adjacent to the US Forest Service (USFS) Rogue River-Siskiyou National Forest (RRSNF), from which the city's water supply is sourced.

The watershed is almost completely forested, with cool, moist winters and warm, dry summers. Drought periods are common (Franklin, 1972). Annual precipitation averages 483 mm, 762 mm, and 1534 mm at lower, mid, and high elevations, respectively, with an average snowfall of 6,731 mm (BCWC, 2007). The dry forests, which are the focus of this restoration effort, are dominated by conifers—Douglas-fir (*Pseudotsuga menziesii*) and ponderosa pine (*Pinus ponderosa*)—along with two prevalent hardwoods, the evergreen Pacific madrone (*Arbutus menziesii*) and important inclusions of deciduous California black oak (*Quercus kelloggii*).

The understory is composed of herbs, grasses, and evergreen shrubs, like *Arctostaphylos patula* and *A. viscida* (Franklin, 1972).

## Forest management history: from fire suppression to resilient forests

The forest management history in the Ashland Watershed has swung like a pendulum throughout the past two centuries. Indigenous peoples stewarded this land for at least 10,000 years before they were forcibly displaced by Euro-Americans in 1856 (Gray, 1987; Minor, 2014). Indigenous Shasta, Takelma, and Athabaskan peoples in the Rogue Basin used fire to maintain a heterogenous mosaic of grassland, savanna, woodland, and forests that promoted a healthy, biodiverse, and productive landscape (Pullen, 1996; LaLande and Pullen, 1999; AFR, 2020). Charred fire scars on old trees and stumps confirmed that fire was a frequent visitor to the forests surrounding Ashland prior to the 1900s. Median fire return intervals were 8 years (range from 3 to 30 years), which became disrupted in the 1850s (Metlen et al., 2018).

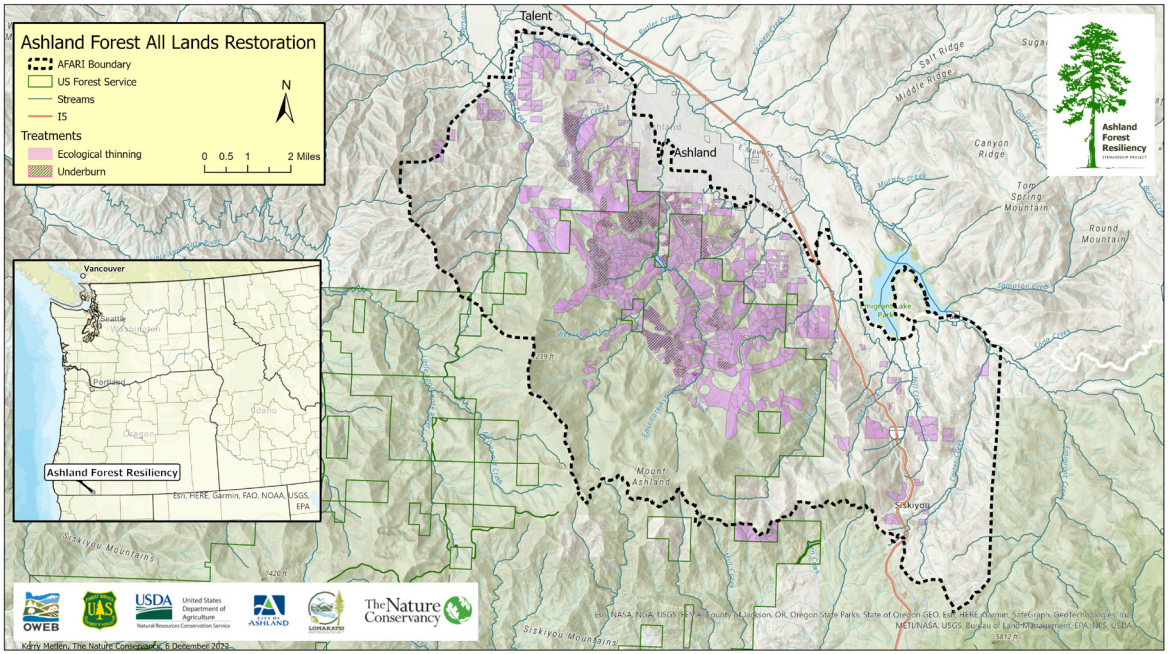


*Figure 1. Map of Ashland watershed showing treated areas, Rogue River-Siskiyou National Forest, and City of Ashland. Source: Ashland Forest Resiliency*

*Figure 2. Reeder Reservoir. Photo credit: Evan Barrientos*

A regular fire regime reduces fire intensity and severity by maintaining low fuel loads, low density of canopy trees, and open forest conditions.

Euro-Americans introduced practices of livestock grazing, extractive logging, and active fire suppression. Across western North America, decades of fire suppression excluded beneficial fire and resulted in increased forest densities, potential for severe fire, increased vulnerability to pest and disease spread, dramatically increased tree density (Hessburg et al., 2019; Hagmann et al., 2021), and mortality of the largest and longest-lived trees (legacy trees) (AFR Bringing Back "Good Fire"). For a summary of these effects written for a general audience, see this storymap and articles like this one by Nathanael Johnson (Johnson, 2021).

As industry swelled across the region, communities and activists successfully sought and secured protection of Forest Reserves by Presidential decree, including protection of the City of Ashland's watershed forests as the Ashland Forest Reserve, established in 1893. In 1929, after the City of Ashland's Hosler Dam and Reeder Reservoir were created (Figure 2), the USFS formalized a Cooperative Agreement to consult with the City prior to making harvest or extraction plans in the Ashland Watershed (Table 1; RRSNF, 1929). After the destructive 1959 Ashland Fire burned into the north edge of the watershed, the Rogue River National Forest initiated timber harvesting until a City complaint about landslides and threatened water quality brought a Forest Service moratorium on logging in 1974.

During the 1980s, anti-logging activists blocked logging roads, organized public protests, filed lawsuits, and lobbied politicians. The clash of cultures between the timber industry and forest protection activists — known as the "Timber Wars"— reached a tipping point in the 1990s when activism and growing science supported the US Fish and Wildlife Service in listing the northern spotted owl (*Strix occidentalis caurina*) as Threatened with Extinction under the Endangered Species Act. Court rulings curtailed old-growth logging on public lands across the Pacific Northwest (Pixley, 2017) and the Northwest Forest Plan was implemented in 1994 to prevent further loss of old growth forest and protect spotted owl habitat.

In the second half of the 20th century, the greater Ashland area shifted from a logging-based to a service-based economy. Americans began moving to Jackson County in the 1960s and 70s for access to recreation and natural serenity (Johnson, 2021). The last remaining lumber mill closed in 1998. The City of Ashland became known for its environmentalism, liberal politics, Southern Oregon University (SOU), and the Oregon Shakespeare festival (Ingalsbee, 2003; Pixley, 2017).

Over the past few decades, land managers worked to reverse the damaging effects of fire suppression in an effort to swing the pendulum back to forest management approaches based on ecosystem resiliency and fire management. This transition set the stage for increasing cooperation with tribes regarding indigenous practices of fire use.

Federal-level fire policies also began to change. Preventive fire management plans became required for all fire-prone, federal lands, detailing plans for strategies from fuel reduction to restoration for fire prevention (Ingalsbee, 2003). The USFS Ashland Ranger District began advancing fuel reduction and thinning to address fire hazard (USDA, 1998). Beginning with the 1995 Federal Wildland Fire Management Policy, a series of federal acts were implemented to achieve forest resiliency in the face of fires and provide financial resources for fuel reduction interventions. The 2001 National Fire Plan formalized a structure for collaboration across land ownership boundaries and jurisdictions, known as the "all lands, all hands" approach (Pixley, 2007, Appendix 1). These federal policies focused on coordination across land ownership, setting the stage for the collaborative forest restoration work in southwestern Oregon that became known as the Ashland Forest Resiliency Project.



## The turning point

During the transition toward fuel reduction interventions, the Ashland Ranger District of the RRSNF proposed the HazRed Project in 1996 to reduce the risk of large-scale, stand-replacing fire within the Ashland municipal watershed (USDA, 1998). The plan involved felling trees in strategic areas to thin the forest, create shaded fuel breaks, and reduce the likelihood of fire spreading into tree crowns. Two local nonprofit conservation organizations, Headwaters and the Klamath-Siskiyou Wildlands Center, generated strong community opposition to the HazRed proposal. Concerned about the commercial implications of the plan and impacts to forest integrity, the environmental community generated six appeals. The Ashland Mayor and City Council submitted a letter to the District Ranger regarding the community's concerns.

Linda Duffy, the District Ranger, responded to concerns about excessive timber marking and had many discussions with community members and local leaders between 1996 and 1999. Marty Main, a City of Ashland contract forester, Dr. Robert Brothers, leader of Headwaters, and Marko Bey, founder of Lomakatsi, were vital players in negotiating a compromise with the USFS (Marko Bey and Chris Chambers, 2022, personal communication).

After many meetings and conversations, in a good faith gesture, Duffy dramatically reduced the number of trees marked to be cut (Johnson, 2021).

During this time, USFS rangers stopped wearing their green uniforms at public events to avoid the stigma associated with the USFS during the Timber Wars and to facilitate trust-building with community members (Marko Bey, 2022, personal communication). Listening to public input and engaging in dialogue was a departure from how the USFS in Ashland previously operated. The local conservation organizations and community members appreciated this new approach, though the timber industry was less enthused by the accommodations (Darren Borgias, 2022, personal communication).

Concerned that the revisions undermined the economic viability of the plan, the RRSNF withdrew the HazRed proposal in July 1998. Before releasing a new draft plan, Duffy actively sought citizen involvement and organized a community dialogue meeting in February 1999. The group decided to meet regularly and expand the participants to include the City of Ashland, business owners, forest workers, and community organizers (Table 1). The group named themselves the Ashland Watershed Stewardship Alliance and submitted their feedback as a proposal in 1999 in hopes of creating a joint committee with the USFS for furthering this work (AWSA, 1999). The new, community-informed, USFS-run project was named the Ashland Watershed Protection Project (AWPP; Table 1) and had the goals of reducing the risk of large-scale, high-severity wildfire and providing high-quality drinking water (USDA, 1999).

In 2004, the USFS had begun designing the Ashland Forest Resiliency Project (AFR). They completed a watershed assessment of Upper Bear Creek, including the Ashland Creek tributary, and laid the ecological and environmental underpinnings for watershed health treatment needs (USDA, 2003). Critically at this time, Congress had passed the Healthy Forest Restoration Act of 2003 (HFRA), sponsored by local Oregon Congressman Greg Walden. Ranger Linda Duffy alerted the City of Ashland and the Headwaters conservation organization of a provision in the HFRA which would require the USFS to analyze a community's alternative plan for wildfire risk reduction and forest health, provided the community had an approved Community Wildfire Protection Plan. This invitation represented yet another major pivot toward community participation in federal forest management. Stakeholders proposed expanding AWPP under the Community Wildfire Protection Plan and AFR replaced AWPP as Ashland's community alternative plan.

An important sidebar to AFR's genesis is the ongoing and proactive forest management strategy implemented by the City in forests adjacent to what would become the AFR project. The City completed a forest plan in 1992. Led by then-Fire Chief Keith Woodley, a newly created Ashland Forest Lands Commission contracted forester Marty Main (Small Woodland Services, Inc.) for forest thinning and fuels reduction which began on City lands in 1995—a time when active management was being challenged regionally. Fuels reduction and forest health work continued on City lands, culminating in a 2004 commercial thinning on 59 ha (145 acres) using a helicopter to remove logs, which were trucked to a local mill with virtually no protest. Public process was front and center during this time when the USFS was regrouping in the wake of the failed HazRed project. The exemplary leadership shown by the City on municipal lands helped turn the tide on adjacent federal lands, boosting support for the follow-on AFR.

The City drew from earlier participants in AWSA and others convened under the auspices of the City Forest Lands Commission, which was supported by the City's consultant Marty Main and staff member Chris Chambers of Ashland Fire & Rescue. By 2004, The Nature Conservancy (TNC) had published an ecoregional assessment identifying "uncharacteristically severe fire" as the primary threat to forest biodiversity of the region (Vander Schaaf et al., 2004). Darren Borgias, TNC ecologist and Southwest Oregon Forest Project director was invited by the City to assist in creating the community alternative. The local group convened under a new name: the Ashland Forest Resiliency Community Alternative Technical Team (AFRCATT; Table 1). Their proposal aimed to replicate historical fire cycles for the project area and restore historical vegetation conditions in the watershed. The team was also supported by the USFS NEPA planner, Don Boucher, who provided key capabilities in modeling and mapping the community concepts which initially called for restoration work on over 3,600 ha (9,000 acres). The USFS proposed a compromise at 3,075 ha (7,600 acres) with reduced treatment in roadless areas and an overlay of shaded fuel breaks in "Strategic Ridgeline Areas" which were considered key to managing future wildfires. The AFRCATT accommodated the compromise and the USFS continued to fine tune the proposal that became AFR. Because of intervening USFS planning needs, political pressure for attention elsewhere, and the lengthy NEPA process, the AFR proposal was finally signed in 2009 (USDA, 2009)

## Actors and arrangements

In 2010 the Ashland City Council unanimously voted to join the Ashland Forest Resiliency Partnership, a collaborative partnership established between the RRSNF, the City of Ashland, Lomakatsi, and TNC. AFR initiated a 15-year (originally 10-year) effort to reduce the threat of severe wildfires across the landscape through collaboration among a large and diverse group of governmental bodies, environmental organizations, citizens, private businesses, and community groups (AFR Project Fact Sheet 9 ). Partners filled specific roles and contributed their unique organizational strength and skills to meet community goals for the reduction of fire hazard and protection of the municipal water supply (Figure 3; outlined in MSA, 2010 attachment). In addition, AFR involved technical experts from many other organizations and academic institutions.

AFR was launched between the four core partners under Stewardship Authority through a Master Stewardship Agreement (MSA) established by Congress in 2003 "to give the U.S. Forest Service and Bureau of Land Management the authority 'to perform services to achieve land management goals for the national forests and the public lands that meet local and rural community needs'" (MSA, 2010). MSAs are a unique USFS legal mechanism and framework that allow the agency to enter into Supplemental Project Agreements (SPAs) with partners that define specific project areas, mutual goals, and partner roles (Davis, 2021). This MSA was critical to getting AFR off the ground collaboratively, and required partners to "put their skin in the game" financially and to develop new contractual relationships that leveraged the strengths of partners. The MSA required work of new complexity and scale (Davis, 2021), allowing AFR to create and fund a long-term monitoring plan that was managed by TNC (MSA, 2010).

The MSA structure also required partners to interact and cooperate (Davis, 2021). Partnerships with industry were also established through SPAs, and restoration by-products were generated from ecological thinning, allowing revenue generated from the sale of restoration by-product logs to be reinvested into additional restoration work. The Stewardship Authority model was successfully utilized by Lomakatsi in partnership with the Umpqua National Forest in 2006, and then subsequently by the RRSNF and Lomakatsi for the Hope Mountain Stewardship Project, setting the stage for its use under AFR (Livingston, 2008).

TNC's role was to help link federal and state agencies with local partners, support community participation, multi-party monitoring, and ongoing dialogue to strengthen the middle ground between environmental and timber interests.

| Duration | Project Name | Partners | Goals |
|---|---|---|---|
| **1996-1999** | Opposition to HazRed old growth logging, transitioning to a collaborative approach | Peace House, Headwaters Environmental Center, Lomakatsi, Forest Lands Commission (City of Ashland), Small Woodlands Services Inc., Klamath-Siskiyou Wildlands Center, local business owners, Croman Corporation and other timber industry companies, environmental groups | Coordinate efforts to oppose the logging of old growth trees and the Ashland Watershed and strategize a new, collaborative path forward |
| **1999-2004** | Ashland Watershed Stewardship Alliance. Supported the USFS Ashland Watershed Protection Project (AWPP) in 2001 | USFS Ashland District Ranger, City of Ashland, business owners, forest workers, and community organizers | Submit community-based recommendations to the USFS' withdrawn HazRed project; treatment of 607 ha (1,500 acres). |
| **2004-2010** | Ashland Forest Resiliency Community Alternative Technical Team (AFRCATT) | Ashland Forest Lands Commissioners, Ashland Fire & Rescue Chief Keith Woodley and Chris Chambers, Ashland City Councilor Cate Hartzell, a few members of Ashland Watershed Stewardship Alliance citizen group, and several environmental organizations | Formulate a community alternative to the USFS plan to reduce wildfire risk in the Ashland Watershed; spurred by 2003 Healthy Forest Restoration Act |
| **2010-*present*** | Ashland Forest Resiliency Stewardship Project (AFR) | RRSNF, TNC, City of Ashland, and Lomakatsi Restoration Project worked under a Stewardship Agreement | To reduce the risk of severe wildfire, secure clean drinking water, and protect forests, wildlife, habitat, people, property, local economy and quality of life in Ashland |
| **2015-*present*** | Ashland Forest All-Lands Restoration Partnership (AFAR) | Natural Resource Conservation Service, AFR, and Joint Chiefs' Landscape Restoration Partnership | Expand project area and stakeholders to include private lands |
| **2020-2025** | AFR (cont.) | RRSNF, TNC, City of Ashland, and Lomakatsi Restoration Project | 5-year extension to AFR Stewardship Agreement on RRSNF federal land |

*Table 1. Timeline of major collaborative projects and partnerships in the Ashland Watershed.*

By linking local and agency partners through a common set of values and emphasizing transparency, TNC enhanced accomplishments among partners (Pixley, 2017). Staff scientists combined rigorous science with a collaborative approach to restore resilience to dry forest landscapes. TNC helped the agencies and the community better understand the historical range of forest conditions, conditions which could promote climate adaptation, and an integrative view which reflected both the needs of people and nature. TNC helped shape the community alternative, launched the project monitoring, and led key research on historical fire intervals and stand conditions to inform project design. TNC Forest Ecologist Dr. Kerry Metlen mentored numerous undergraduate and graduate students in research on the project.

An Implementation Review Team (IRT) coordinated by TNC provided external technical review of proposed and ongoing work. This team included technical experts from OSU Forestry and Natural Resources Extension, the Klamath-Siskiyou Wildlands Center, and the Southern Oregon Forest Restoration Collaborative. Their review and inputs were coordinated for the AFR partners by Kerry Metlen. Their independent, third-party review added further transparency and built potential for greater trust in the project and partners.




*Figure 3. Roles of partners that make up the Ashland Forest Restoration Partnership. Source: City of Ashland*

The City of Ashland's key roles were to funnel community input and lead community engagement through the Community Engagement Plan. The City fostered public trust and support, and levied a monthly fee (US$3.00 as of 2022) on all City water bills starting in 2015 that generated US$175,000 annually to both complete needed cutting of brush and small trees and to maintain AFR's work in perpetuity by reintroducing "good fire" to maintain reduced fuel levels (AFR An All-lands Restoration Project; Weiser, 2018). Aside from its funding and community engagement roles, the City also contributed technical forestry expertise to AFR from their experience managing City lands adjacent to AFR.



Lomakatsi is a local, non-profit NGO whose central role is to design and implement the restoration for the AFR/AFAR projects. Marko Bey started Lomakatsi in 1995, working with small-scale, private landowners in Ashland's surrounding area. Lomakatsi brought 25 years of ecological restoration experience to the AFR partnership, including extensive programmatic and implementation capacity. Their skilled forest restoration technicians designed and supervised the implementation within the Ashland Watershed. Lomakatsi served as the lead administrative entity throughout AFR, responsible for administering contracts with forestry services providers and commercial timber sales, including marketing the sale of logs to local mills.

Lomakatsi leveraged its multi-cultural workforce and close relationship with the Northwest Forest Worker Center to elevate the role of on-the-ground forest managers (Tom Greco, 2022, personal communication). Lomakatsi raised funds to implement public programs that engage the community in active restoration of the watershed through education and tours. They offered training and workforce development programs for adults and youth to AFR that continue today (Lomakatsi Youth). Through Lomakatsi's Tribal Partnerships Program and Tribal Ecosystem Workforce Training Program, over 20 Tribal crew members have supported AFR since 2011 and Tribal involvement continues today (AFR, 2020).

The USFS' RRSNF is the primary land manager and has jurisdiction over nearly all of the AFR project area, but less than half of the larger AFAR project area. USFS navigated to their role in the group as a collaborative partner, a significant shift from their traditional prescriptive role. Don Boucher of the USFS elaborates, "Typically, when the Forest Service would do a project or a contract we'll write prescriptions, lay it out, give specifications on how to do the work. On this one we started, we didn't have any of that. So, the partners filled that role for us by doing a lot of that work that the Forest Service would usually do. That really, I think, was really key.

That added capacity to getting it off the ground and moving—plus, I mean, having the advantage of [cost-share] funding." (Interview 38, Don Boucher, USFS agency member) (Pixley, 2017, p. 52-53). The RRSNF fire staff developed the parameters and provided oversight for prescribed fire (AFR, 2020).

The Ashland Forest All-Lands Restoration Partnership (AFAR; Table 1), initiated in 2015, encompasses 23,472 ha (58,000 acres) including the City's municipal water supply and adjacent private lands (OWEB, 2017). Ecological fuels reduction on private lands is the key additive strategy of the all-lands project, which had previously only been accomplished on federal land and land owned by the City of Ashland (USDA, 2015a; NRCS, 2015). The expansion and recruitment of new landowners is in part due to the close relationship AFR partners have had with the local Natural Resource Conservation Service (NRCS), the federal agency responsible for restoration on private lands in a Joint Chiefs' project. Lomakatsi led landowner engagement in partnership with NRCS and the City of Ashland, which included recruitment and site visits to develop agreements and prescriptions. The NRCS had been actively engaged with landowners in the area while fostering relationships with area professionals. The City of Ashland had also been working with adjacent private landowners under various grant funds between 2002 and 2008 (Chris Chambers, 2022, personal communication). Since 2001, Lomakatsi had been administering National Fire Plan programs, working with private landowners in Jackson and Josephine counties—including around Ashland—laying the ground work of social license through public engagement, workshops, and tours of ecological thinning and pile burning sites.

## Costs and funding

In 2009, fortuitous timing brought in US$6.2 million to the RRSNF from the American Recovery and Reinvestment Act (ARRA) as an appropriation from the federal government to the USFS to kick-start implementation during 2010–2013 (Pixley, 2017). These funds enabled treatment of over 1,620 ha (4,000 acres) and gave AFR time to obtain additional funding from other sources and to expand the project area. From 2009 to 2016, AFR received over US$17 million in grants, which includes expansion of the restoration plan in 2015 under the Joint Chiefs program to incorporate adjacent private lands (Pixley, 2017). In 2015, AFR was awarded the Oregon Watershed Enhancement Board's Focused Implementation Project grant for US$6 million over 6 years. An additional US$1.2 million was added through USFS State and Private Forestry through a grant to TNC and sub-awarded to partners to support treatments, including prescribed burning on private, non-industrial land holdings in the AFAR footprint.

As of 2021, the AFR project has received around US$28 million in grants, primarily from the federal government but also from the state, tribal organizations, non-profits, and philanthropic donors, and through the monthly water bill fees levied by the City (Johnson, 2021). Logs harvested from thinning across 80% of the project area were generally small in size (average diameter 13 inches), but the project reinvested US$6 million from the sale of these logs. Of the 3,076 ha (7,600 acres) in AFR, only 32% had removal of commercial by-products (Don Boucher, 2022, personal communication). Treatment costs were expensive, and generally amounted to about US$2,842/ha (US$1,150/acre) (AFR Economics). Major project costs that regularly needed funding included project design, prescription development, monitoring, outreach, and engagement (MSA, 2010). Helicopter removal, a particularly expensive practice, was essential to minimize impacts of logging in sensitive, especially steep, areas of the watershed. However, costs of fuel reduction and prescribed fire treatments are small when compared to costs of fire-fighting and the negative effects of large and severe fires on water supplies and public health and safety of communities (Colavito et al., 2021). An early study in 2014 estimated that initial AFR investments had already saved the federal government and the City of Ashland US$20 million by avoiding expensive reservoir dredging, temporary water supply, and reducing fire suppression costs and losses in recreation activity (Talberth and Bird, 2014).

▲ *Figure 4. Before (left) and after (right) treatment. Photo credit: Lomakatsi Restoration Project*

▼ *Figure 5. Slash pile burning on the left, and prescribed underburning on the right. Photo credits: Oregon Department of Forestry (left) and Lomakatsi Restoration Project (right)*



# Implementation

In 2009, the AFR team developed the MSA within three months of the Record of Decision being signed, formalizing the partnership between federal and non-federal partners for treating 3,076 ha (7,600 acres) in the RRSNF (Pixley, 2017). Once the ARRA funds were received, the next step was to strategically identify forest units for specific fuel reduction treatments. The City of Ashland initially played a large role in collecting data and project design, particularly for commercial logging areas. Lomakatsi continued this work as AFR's project design lead;; their technical forestry crews collected data, then designed and marked treatments. Local residents and business owners were invited to review trees marked for harvesting. The City organized dozens of tours to explain to residents what they planned to do and why. This transparency created trust and enabled cooperation of the local community, an essential component of AFR.

***Fuel reduction and prescribed burning.*** By March 2013, the ARRA funds had been spent to treat 1,214 ha (3,000 acres) in the Ashland Watershed, including 799 ha (1,974 acres) of wildfire fuels reduction, 399 ha (987 acres) of fuels removed through pile burning, 247 ha (610 acres) of helicopter thinning, 134 ha (332 acres) of ground-based thinning, and 373 ha (921 acres) of fuels clean-up following thinning operations (Ashland Watershed Update, 2014). Implementation generally begins with ecological thinning of surface and ladder fuels, followed by slash piling (Figure 4). In the next step, commercially viable trees, typically over 8" in diameter, deemed in excess of restoration goals are cut, removed, and sold to fund additional forest work. The process and by-product logs supported local mills and provided contractors and workers with jobs. After drying, slash piles were carefully burned when conditions were just right (Figure 5). Then the land was left for a few years of recovery before prescribed underburns were conducted in areas of up to 28 ha (70 acres) at a time (Figure 5b; Chris Chambers, 2022 personal communication).

Lifting harvested trees by helicopter reduced damage to fragile, granitic soils. After thinning, Lomakatsi rehabilitated roads and trails, working with local recreation groups and coordinating between subcontractors and tribal crews. In contrast to previous commercial logging operations that harvest large trees for profit, the vast majority of merchantable trees felled as part of the AFR project were less than 16" in diameter. The vast majority of the trees removed were relatively young, fire-sensitive Douglas-fir and white fir that established in the absence of recurring fire (AFR Monitoring 2017 Factsheet; Johnson, 2021).

In addition to restoration treatments conducted on USFS lands, the City of Ashland carried out coordinated helicopter thinning treatments in 2013 on one tract of the City's 405 ha (1,100 acre) ownership. The Forest Division of Ashland Fire & Rescue worked closely with Lomakatsi and RRSNF to coordinate treatments on adjacent private lands.

The 2015 implementation of AFAR by the NRCS, AFR partners, and landowners aimed to reduce wildfire risk and strengthen forest resiliency. Financial incentives from NRCS enabled private landowners (Figure 6) to hire Lomakatsi forest technicians to cut trees and burn slash piles on their forestland to reduce risk of large-scale crown fires. This "all lands" phase of the AFR partnership (Table 1) expanded the project area from 8,900 to 21,400 ha (22,000 to 53,000 acres).



*Figure 6: Private landowner and local business owner Pancho Parker and his daughters shown working on their property. With more local funding sourced from AFR, Parker was able to hire on more employees for his small forest management company. Photo credit: Natural Resources Conservation Service*

Scientists and land managers working with AFR used controlled underburns to restore and maintain forests in the Ashland watershed. Dr. Kerry Metlen, a TNC forest ecologist, emphasized that "We need to learn from historical fire and forest conditions as a reference for what we want in the future." (AFR, 2020). To achieve these reference conditions, a burn plan and site "prescription" are followed to create conditions that allow fire to consume litter, seedlings, and saplings, while protecting larger trees and soils. Fire managers chose to burn on days when weather conditions would send smoke away from nearby sensitive communities as much as possible. To protect the safety and well-being of all residents in the Rogue Valley and the City of Ashland, AFR partners organized the Smokewise Ashland effort to help those most vulnerable to smoke and citizens impacted whether the smoke is from controlled burning or summer wildfires. The project distributed over 600 air purifiers to Ashland residents and provided a clearinghouse of information for smoke-sensitive individuals.

Bringing back "good fire" was presented to the community as a good practice for managing forests, for stabilizing the economy, and a better choice for public health (AFR Bring back "good fire"). Controlled underburns were planned with required safety precautions in place, and lit by fire workers during carefully selected and monitored conditions (OWEB, 2017; Figure 5). AFR became a learning laboratory, providing training for professionals and others who came to Ashland to learn and practice the art and science of controlled burning with the USFS and other partners as part of TNC's Prescribed Fire Training Exchange, or TREX, program. In 2020, AFR celebrated ten years of community-based collaborative action to ensure wildlife safety and forest health in a rapidly changing climate. Work continues into the future with a solid foundation of trust, cooperation, and broad engagement of local residents with forest management leaders.

***Multi-party monitoring.*** Starting in 2009, the parties were convened by TNC to identify key values to be monitored in a broad-based, multi-party monitoring plan, with input from researchers and partners from academia and local organizations. Once AFR commenced, the collaborative monitoring effort was supported by personnel from USFS, TNC, the City of Ashland, SOU, the National Park Service, Klamath Bird Observatory, and citizen scientists (Metlen and Borgias, 2013). Beginning in 2010, partners collected baseline data on many variables and laid a foundation for collaborating with many local organizations.

The multi-party monitoring plan had three major components: 1) administrative monitoring (project management, funding, expenditures, and jobs created); 2) implementation monitoring (adherence of the actions on the ground to the design, implementation guidelines, and prescriptions developed for fuel reduction treatments); and 3) effectiveness monitoring (to evaluate how well the implemented treatments achieved the desired outcomes relative to stakeholder concerns).

The IRT was tasked with external technical review of proposed and ongoing work. They reviewed unit maps, boundaries, prescriptions, marking, operations plans, and mitigation provisions, and monitoring results. Implementation indicators included acres treated, conformance to design elements, and how well the prescription targets were attained as measured through basal area and canopy closure. Additional indicators of interest were snag and down wood abundance, soil disturbance, exotic species presence, and impacts on late successional wildlife habitat (Metlen and Borgias, 2013). Aerial photographs and lidar data were collected in 2006 and used for project planning and monitoring. In 2009–2010, surveys completed in 738 permanent Common Stand Exam Plots stratified throughout the project area provided baseline data on tree basal area, density, mean diameter, and fuel loadings. Representative photographs were taken before and after each treatment.



Effectiveness monitoring included social indicators regarding stakeholder concerns and outreach effectiveness (Shibley and Schulz, 2012; Shibley et al., 2014; Shibley, 2020). Social monitoring began in 2009 with a survey of AFR stakeholders. Longitudinal surveys of registered voters in Ashland were conducted during 2012–2015 by researchers at SOU (Shibley et al., 2020).

Ecological monitoring tracked the project's ecological outcomes (Metlen and Borgias, 2013; Appendix 2). Baseline forest structure data were used for additional analyses of changes to wildfire hazard (Bailey and Dunn, 2021), legacy tree retention and responses to treatment (Boving et al., 2021), hydrological responses to treatment (Kurzweil et al., 2021), Pacific fisher trends (Smith, 2021), and climate change implications for Ashland forests (Strahan, 2020). Multiple SOU capstone projects contributed to these monitoring efforts.

***Public engagement and education.*** The AFR partners recognized community members as willing participants and volunteers in the restoration process. The City of Ashland and all AFR partners worked together to engage and inform the community. AFR led forest tours, which connected hundreds of community members with the ongoing restoration (AFR, 2020).

Chris Chambers, the Wildfire Division Chief for Ashland Fire & Rescue with the City of Ashland, heralded the importance of community engagement efforts as part of AFR: "Engaging the community was never a question in AFR. Ashland residents know a lot about forests and the kinds of work we were proposing were going to have a big impact on people's lives. Having them learn more about their forests and understand why work needed to happen was critical to build and maintain social capital necessary to get this critical project implemented" (Chris Chambers, 2022, personal communication).

Community members were regularly informed of the planning and execution of controlled burns through the posting of burn plans on AFR's webpage and the opportunity to sign up for non-emergency notifications for controlled burns (AFR homepage). Public flyers announcing helicopter thinning explained why thinning was helpful to the community, why thinning was done using helicopters, and when and where trails would be closed (e.g. AFR Stewardship Project 2015/2016 Helicopter Thinning).

The all-lands approach of AFAR required partners to maintain good working relationships with private landowners (Figure 6). Nearly 44% of Oregon is privately owned, making private lands an important area of focus for fire mitigation and conservation of at-risk species. Word of mouth communication through neighbors was an effective tactic for landowner recruitment, as was targeted outreach coordinated by the City of Ashland.

A central responsibility of Lomakatsi was to develop training and education opportunities (Figure 3, Figure 7). Beginning in 2011, for seven consecutive years Lomakatsi managed an adult workforce training program through a partnership with The Klamath Tribes. During this time, Lomakatsi employed 20 tribal members seasonally, representing members of The Klamath Tribes, Ajumawi-Atsuge Nation (Pit River Tribe) and Northern Paiute. This program was made possible with funding from the American Recovery and Reinvestment Act, with crew lodging expenses supported by The Klamath Tribes. Tribal crew members employed by Lomakatsi continue to support work in AFR today.

Youth involvement has also been an integral part of AFR, with over 2,000 youth engaged through field activities, learning about watershed function, local ecology, and forest stewardship. Each summer beginning in 2013, 15-20 high school students are selected to participate in Lomakatsi's Youth Ecological Stewardship Training and Employment

Program. They participate in hands-on training in forest restoration with experts from Lomakatsi, USFS, and other partners, designed to spark an interest in a natural resource career path (Lomakatsi and Ashland Forest Resiliency). Students in the program have worked on fuel reduction treatments, noxious weed management, prescribed burn preparation, fuel break enhancement, riparian planting maintenance, native grass seeding, and trail construction and maintenance. Through their Tribal Partnership Program, Lomakatsi began developing this model in 2011 with tribal communities in Klamath, Shasta and Siskiyou counties. In 2021, it evolved into the Tribal Youth Ecological Forestry Training Program, which provides professional certifications in wildland fire, chainsaw operation, and cultural monitoring to tribal youth aged 18-26 (Figure 7). These programs have included restoration work as part of AFR. In 2019, the Southern Oregon Fire Ecology Education consortium developed a curriculum on fire science and teacher training for elementary and outdoor schools (AFR, 2020).



## Outcomes and impacts

AFR is well on the way to achieving its ambitious objectives. Restoration activities have reduced the risk of large-scale wildfire, increased the survival of legacy trees, restored healthy forest ecosystems, and protected critical watershed services for people and wildlife. In the process, a new “stewardship ethic” took hold within the local community, forever changing perspectives about how to cope with the challenges of living in a fire-prone forest landscape in a changing climate. The blurry boundary between the RRSNF and the City of Ashland created a sharpened awareness of the urgent need for unified and collaborative actions to protect the Ashland Watershed for people, forests, and wildlife. “There was this whole paradigm shift,” said Darren Borgias. “We’re fundamentally changing the culture’s relationship to fire, and Ashland is helping to represent what that change could be” (Weiser, 2018).

AFR is widely recognized as a model for collaborative forest restoration at the regional and national scale. Initially skeptical local residents grew to be enthusiastic about the forest management interventions. Field tours were conducted at every phase of implementation so that community members felt like their voices were heard along the way.

*Figure 7. Forest Biologist Dave Clayton with the Lomakatsi Restoration Project Youth Crew. Photo credit: RRSNF*

The AFR partners built trust slowly over time by allowing community members to see, touch, and feel the changes that were being made to the ecosystem (Marko Bey, 2022, personal communication). Social surveys conducted in 2010 and 2019 showed that support for controlled burning rose from 52% to 76%, while support for thinning rose from 58% to 80% (Shibley, 2020).

During the first ten years of operation, AFR provided 17 full-time jobs per year and provided over 100 living wage seasonal jobs. Over 200 people received worker training, increasing local knowledge and skills across the community and providing unique opportunities for the public and school children to learn and engage in building a new "stewardship ethic" (AFR Economics). From 2011–2019, Lomakatsi and the City of Ashland led over 40 in-class presentations and field activities for 2,500 students from grades 3 through 12. The AFAR project signed 108 contracts with private landowners to complete 1,255 ha (3,100 acres) of fuel reduction treatments on private lands (AFR, 2020).

AFR fuel reduction and forest restoration interventions reached 4,047 ha (10,000 acres) of the 8,900 ha (22,000 acre) project area. The AFAR treatments extended to 5,868 ha (13,300 acres) by 2018, covering 28% of the extended project area (Borgias et al., 2018) and conducted controlled underburning on 607 ha (1,500 acres). These actions protected old-growth trees and homes across 23,500 ha (58,000 acres) of watershed and wildland urban interface. Due to the thinning of predominantly smaller in-growth trees, the average size of trees retained (quadratic mean diameter) increased up to 30%, showing that large, fire-resistant trees were retained in line with project objectives to preserve and enhance older forests" (AFR Partners, unpublished data).

Fuel reduction treatments (Figure 8) in two sub-watersheds of Ashland Creek did not affect hydrological functions or water yields from 2012-2019, and canopy cover at the watershed scale decreased by only 3–4% (Kurzweil et al., 2021). Monitoring of water quality and aquatic stream biota during the first six years of fuel reduction treatments found no significant changes in total abundance and richness of macroinvertebrates, suggesting that all sampled streams provided functionally stable habitats (Schroeder, 2017). Monitoring data showed that ecological thinning followed by underburn treatments reduced wildfire hazard by raising the canopy base height and decreasing fuels, which shortened the predicted flame lengths.

*Figure 8. Forest area in the Ashland watershed after ecological thinning, pile burning and underburning. Photo credit: Evan Barrientos*

Analysis showed a 50% reduction in predicted flame length from thinning and pile burning. In underburning units, flame length was reduced an additional 55% (OWEB, 2017). A later report supported a strong reduction in fire risk by completing underburns after thinning (Bailey and Dunn, 2021).

Plans are in the works for the AFR project to be incorporated into the regional Rogue Forest Partners work to implement the Rogue Basin Cohesive Forest Restoration Strategy (https://rogueforestpartners.org/; Metlen et al., 2021). This upcoming restoration alliance is in the design phase. The full scope of the Rogue Basin Strategy treats 25% of the 1.9 million ha (4.7 million acre) Rogue Basin. The Rogue Forest Partners include 11 organizations, 3 NGOs, and local government agencies. Lomakatsi, the City of Ashland, TNC, and USFS will remain as partners in this future work to focus on capacity development and maintenance of restoration areas.



## Key challenges

AFR faced administrative and implementation challenges. Initially, the partners confronted rigid and bureaucratic federal institutions that followed long-entrenched fire suppression policies (Pixley, 2017). Inevitable USFS personnel turnover complicated long-term project engagement with partners. It took four years for NEPA approval of the AFR proposal, imposing a major delay on actions by federal entities (such as USFS) to begin fuel reduction treatments. The City of Ashland initiated similar treatments on its own land prior to 2009, but the AFR partnership could not begin work until the NEPA review process was completed (Pixley, 2017). Weather conditions strongly affected smoke conditions in the City of Ashland so that flexible schedules were required, and state air quality regulations and administration often constrained opportunities for controlled burning (OWEB, 2017).

Aligning expectations across partners and the community presented a challenge throughout the project. As Marko Bey put it, “It’s the people management that’s the most challenging” (Marko Bey, 2022, personal communication). The process of making joint decisions took time to iron out. Eventually, AFR partners found that making decisions with one representative from each partner (Figure 3) was more effective and efficient than sitting with everyone to achieve broad consensus (Kerry Metlen, 2022, personal communication).

As for community engagement, it was challenging to align restoration science needs with what community members expected and tolerated. Partners found that restoration to meet the needs of climate adaptation was more intense than the community currently supports, but also that limited interventions can still move the landscape in the right direction (Kerry Metlen, 2022, personal communication). Implementation of thinning and controlled burning treatments was more conservative than original plans called for, with basal area reduction only 30–35% on treated lands (Marko Bey, 2022, personal communication).

Nationally, rising costs of fire management redirected funding from USFS budgets to firefighting, reducing funds for restoration and other proactive activities. Further, declines in commercial timber harvest and increasing fire severity significantly reduced revenue for restoration interventions (Pixley, 2017). Public funding for AFR was available in the form of short-term grants that did not provide for long-term, regular maintenance of treated areas. Although restoring forest through fuel reduction and prescribed burn treatments is highly cost-effective in the long-term, upfront costs were substantial. “These projects are expensive. They take a long time to plan. They take a long time to put into effect, and you have to maintain it if it’s gonna have long-term value,” explained an Oregon Dept. of Forestry agency member (Pixley, 2017, p. 46)

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Climate change poses further challenges, leading to longer and more severe fire seasons. Since 1970 the fire season in southern Oregon has increased by 78 days (USDA, 2015b). The influx of people moving into wildfire-prone areas has increased the number of homes that are vulnerable to fires (Pixley, 2017). Climate adaptation was not explicitly considered in AFR’s design, and it’s hard to know how effective AFR’s treatments will be if a fire starts on a hot, windy day at the tail end of a drought (Chris Chambers, 2022, personal communication). Under the right conditions, anything will burn. Instead, AFR treatments were designed to encourage recovery (improve resilience) after the fire, not necessarily prevent fire (Don Boucher, 2022, personal communication). Despite multiple ignitions in the AFR project area over the years, no fire has burned in the AFR treatment area with sufficient intensity to rigorously test this yet. Disease and pests have surged in the past 20 years, threatening conifer forest and killing legacy trees in particular. Forests in the Rogue Basin have changed so fundamentally in structure and function that it may be unlikely to restore them to historical conditions. Building forest resilience to climate change and unprecedented disturbances is an important priority, but not yet planned for (Chris Chambers, 2022, personal communication).

# Enabling factors and innovations

The success of AFR stems from a true collaboration of highly engaged partners that were present at the right place at the right time and who were all focused on pursuing long-term restoration objectives. The partners made a convincing case that although forest restoration is expensive upfront, far more money is saved in the long run (Talberth and Bird, 2014). The MSA enabled partners to take on tasks that the USFS alone could not undertake, enabling a true public-private partnership.

Critically, the 2003 HFRA created the capacity for local groups to work alongside federal agencies. As Donna Mickley, former Siskiyou Mountains District Ranger stated, “The Ashland Forest Resiliency partnership helped the Forest Service connect with communities, by providing technical expertise and workforce capacity for project implementation and effectiveness monitoring, and by leveraging additional funding to do this critical forest restoration work” (AFR, 2020). No one group served as the main organizer or decision maker, and each partner fulfilled a distinct and complementary role, integrating group feedback at every step.



The Ashland Watershed was attractive for investment in forest restoration. Embedded in a forest and surrounded by mountains, its location places it at high risk for wildfires and floods, endangering the community and threatening the surrounding wildlands. By the turn of the 21st century, the US federal government began investing federal funds into forest restoration and fire mitigation projects (Appendix 1). AFR found funding from several sources: federal funding, state-level funding, and locally-sourced funding. In April 2022, the Biden administration announced an executive order to promote fire resilience and combat deforestation in the US’ forests (White House Executive Order, 2022), which could lead to new funding opportunities for AFR/AFAR.

AFR partners prioritized investing in their workforce, building strong public support from multiple stakeholders. Lomakatsi had developed tribal relationships prior to AFR through the Native Studies program at SOU and connecting with elders in the inter-tribal community and had integrated traditional ecological knowledge through their Tribal Partnerships Program. AFR served as a regional learning center for tribal partners to practice traditional restoration (e.g., build prescribed fire skills) and Lomakatsi employed 27 tribal members full-time as of 2022.

Local workforce members and crew managers were trained with talking points regarding their work so that community members that approached them in the field could be informed why they were doing what they were doing (e.g., variable density thinning and clearing brush to protect legacy, hardwood trees). Previous work by Lomakatsi on pilot restoration projects on private lands facilitated access to these lands for the all-lands initiative of AFR (Marko Bey, 2022, personal communication). Marko Bey pointed out, “Before community conversation, you had lawsuits. You had no management happening. You had complete polarization. Even spending a couple of years in meetings and planning is a short-term investment for a long-term yield” (Johnson, 2021).

AFR partners made up-front investments for long-term, sustainable success. While protecting Ashland from severe wildfire, floods, and water contamination were immediate goals, AFR planted seeds for collaborative, sustainable forest management, prioritizing community engagement in the restoration process and getting private landholders on board. The fact that a federal agency would consider community input beyond what NEPA requires is a novel feature of AFR. Investments were made to assess social capital, including the longitudinal social surveys conducted by Mark Shibley at SOU to track the community’s increased support of AFR through the years (Chris Chambers, 2022, personal communication). By conducting tours of planned treatment areas and opening seats at the decision-making table to community members and new partners, the USFS created a culture of trust and cooperation.



# Key lessons learned

- ***Trust is at the heart of all-lands management.*** *Transparency and frequent communication is essential for community members and help align project objectives with landowner needs. Mistakes are inevitably made along the way, but owning these mistakes is important to maintain community trust (Marko Bey, 2022, personal communication). Neighbor-to-neighbor trust building and learning was the most efficient strategy for landowner recruitment.*

- ***Restoration implementation needs to be flexible in response to changing environmental conditions.*** *Global warming has brought unprecedented drought, catalyzed disease and pest invasion, and shifted dry and wet seasons, so implementation methods had to change correspondingly. Climate adaptation will be central to the design of restoration projects in Ashland following AFR.*

- ***Strong collaborative arrangements are essential to identify constraints, build flexibility, and leverage strengths across partnerships.*** *No single entity can resolve or manage all urban/wildland concerns. The most effective partnerships leverage the unique and complementary strengths of partners. Making space at the table for all partners, regardless of their size and power, is essential. Spelling out the responsibilities in partnership relationships helps hold accountability and collaborative spirit (Marko Bey, 2022, personal communication).*

- ***Project funding needs to support restoration costs in addition to supporting a local workforce.*** *Creative funding strategies are needed to support the direct expense of restoration treatments (Pixley, 2017). Building capacity in the local labor force creates a culture of partnership and public support.*



# Learn more

# Further information and resources

## Websites

Ashland Forest Resiliency Storymap
https://storymaps.arcgis.com
Ashland Forest Resiliency Stewardship Project
https://www.ashland.or.us/Sectionindex.asp?SectionID=503
Lomakatski Restoration Project
https://lomakatsi.org
Smokewise Ashland
https://www.ashland.or.us/Sectionindex.asp?SectionID=534
Joint Chiefs' Landscape Restoration Partnership
https://www.nrcs.usda.gov/programs-initiatives/joint-chiefs-landscape-restoration-partnership
EPA homepage
https://www.epa.gov/nepa/what-national-environmental-policy-act
USFS Northwest Plan
https://www.fs.usda.gov/detail/r6/landmanagement/planning/?cid=fsbdev2_026990

## Factsheets

Ashland Forest Resiliency Factsheets
https://www.ashland.or.us/Page.asp?NavID=17198
AFR An All-lands Restoration Project
https://www.ashland.or.us/SIB/files/AFR/Factsheets%20and%20One%20Pagers/AFR_All_Lands_Fact_Sheet_public_142021.pdf
AFR Bringing Back "Good Fire"
https://www.ashland.or.us/Files/Controlled%20Burning%20factsheet_FINAL.pdf
AFR Economics
https://www.ashland.or.us/Files/Economics%20Fact%20Sheet%2001102016.pdf
AFR Monitoring 2017 Factsheet
https://tnc.app.box.com/s/h16aycyz13w4mro78ilycs9pvis83o63

## Videos

Carrying the torch
https://vimeo.com/217234470?embedded=true&source=vimeo_logo&owner=66568265
Fire for Water: Forest Restoration for Ashland (2014)
https://www.youtube.com/watch?v=X5dN0hSFx-k
AFR Stewardship Project (2011)
https://www.youtube.com/watch?v=n0r3O4Zh3gQ
AFR Proactive Fire Planning
https://www.youtube.com/watch?v=gXFPPr8_0sw
Helicopter yarding in the small diameter fuels reduction sale in Ashland Oregon
https://www.youtube.com/watch?v=DTAwKkVN138
Celebrating 10-Years of Work! (2020)
https://www.youtube.com/watch?v=3gOQg5mu-vo
Restoring the Role of Fire in our Forest and Preparing for Smoke in a Changing Climate
https://www.youtube.com/watch?v=A-LeavtY9rs&t=86s
Reducing Wildfire Risk in Ashland, Oregon also stimulates local economy (Parker Family)
https://www.youtube.com/watch?v=8brPQte2gaI&t=223s

## News stories

How one town put politics aside to save itself from fire
https://grist.org/extreme-weather/how-one-town-put-politics-aside-to-save-itself-from-fire-ashland-oregon/

One Western town's solution to wildfires? Community.
https://www.csmonitor.com/Environment/2021/1008/One-Western-town-s-solution-to-wildfires-Community

Cities want green spaces
https://nextcity.org/urbanist-news/cities-want-green-spaces-heres-how-to-make-them-more-fire-resistant#:~:text=But%2C%20in%20parts%20of%20Ashland,to%20spread%20into%20adjacent%20neighborhoods

Lomakatsi Restoration Project, Ashland Fire & Rescue work to restore watershed ecosystem
https://ktvl.com/news/local/lomakatsi-restoration-project-ashland-fire-rescue-work-to-restore-watershed-ecosystem

Stopping wildfire before it happens
https://www.mailtribune.com/top-stories/2020/08/25/stopping-wildfire-before-it-happens/

#Fridaysonthefarm: AshlandForest Restoration Project Reduces Wildfire
https://nrcs.maps.arcgis.com/apps/Cascade/index.html?appid=be14b7344c7d486088c588c354dd68f8



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# Appendix 1. Federal and regional policies that created conditions for the Ashland Forest Resiliency.

*Information gathered from Pixley 2017; EPA homepage; and USFS Northwest Plan.*

| Year | Policy | Brief description |
|---|---|---|
| **1970** | **National Environmental Policy Act (NEPA)** | Required federal agencies to assess environmental impacts of proposed construction projects<br>Created a process for public input<br>Referred to by professionals as a "necessary evil" due to its bureaucracy and lengthy timelines, yet important and comprehensive reporting |
| **1994** | **Northwest Forest Plan** | Initiated to end the impasse over federal forest management within the range of the northern spotted owl, an endangered species.<br>Included restoration as a land management priority |
| **1995** | **Federal Wildland Fire Management Policy (FWFMP)** | Marked the end of the dominant fire suppression model in US forest management<br>The first national policy to acknowledge coordinated involvement of private landowners |
| **1999** | **Stewardship Authority** | The US Forest Service piloted the Stewardship Authority for an initial 10-yr period beginning in 1999, before it was adopted permanently via the 2014 Farm Bill. |
| **2001** | **National Fire Plan (NFP)** | Prioritized partnerships and protection of communities, natural resources, and human lives through forest resiliency<br>Provided funding for fuels reduction to reduce human and environmental impacts of wildland fire |
| **2002** | **Wildland Fire Leadership Council** | Outcome of the NFP<br>Established as an intergovernmental committee to implement and coordinate the FWFMP<br>Comprised of federal, state, tribal, county, and municipal government partners |
| **2002** | **Fire Learning Network** | Developed by The Nature Conservancy, with additional support from the USFS, and US DOI<br>Composed of experts in collaborative fire management to offer hands-on facilitation for fire mitigation across stakeholders<br>Developed TREX program for prescribed burns across landowner boundaries to bring "good fire" back to the landscape |
| **2003** | **Healthy Forests Restoration Act** | Implemented core component of the NFP<br>Streamlined NEPA review processes<br>Required public engagement in fuels reduction processes<br>Mandated community wildfire protection plans which divied up fuel reduction treatment responsibilities to public and private landowners |
| **2009** | **Collaborative Forest Landscape Restoration Program** | Encouraged managers and landowners to work across ownership boundaries<br>Funding to enable 2010 Cohesive Strategy implementation<br>Administered by USFS |
| **2010** | **National Cohesive Wildland Fire Management Strategy** | Developed a collaborative structure for coordinated fire management involving an "all lands, all hands" approach - between state and local governments and across land ownership types<br>Encouraged living with wildland fire through three goals: 1) resilient landscapes, 2) fire adapted communities, 3) safe and effective wildfire response<br>Encouraged restoration through reintroducing fire |
| **2014** | **Two Chiefs' Joint Restoration Partnership** | Developed to fund the Cohesive Strategy implementation<br>Administered by both USFS and Natural Resources Conservation Service<br>Funds fire restoration work in mixed-ownership landscapes |

# Appendix 2.

*(from Metlen and Borgias, 2013 Multi-party Monitoring Plan)*

**Table 8:** Social and ecological stakeholder concerns are addressed by measuring indicators. Lead collaborators are responsible for collecting the data to evaluate indicators.

| Stakeholder Concern | Indicator | Lead Collaborator* |
|---|---|---|
| ***Social monitoring*** | | |
| Outreach | Effectiveness of AFRSP outreach | Chris Chambers (COA) |
| Community support and engagement | Public knowledge and attitudes about AFRSP | Mark Shibley (SOU) |
| ***Ecological monitoring*** | | |
| Water Quality, Quantity, and Aquatic Habitat | Sediment deposition in creeks | Ian Reid (FS) |
| | Macroinvertebrate assemblages | Pete Schroeder (SOU) |
| | Bathymetry of Reeder Reservoir | Pieter Smeenk (COA) |
| | Sedimentation models | Narcisa Pricope (SOU) |
| Large Tree Retention and Survival | Large tree abundance | Kerry Metlen (TNC) |
| | Large tree vigor | Kerry Metlen (TNC) |
| | Insect and disease conditions | Ellen Goheen (FSFHP) |
| Late Successional Habitat | Northern spotted owl | David Clayton (FS) |
| | Pacific fisher | David Clayton (FS) |
| | Arboreal rodents | Todd Wilson (PNW) |
| | Late successional vegetation | Kerry Metlen (TNC) |
| | Partners in Flight focal species | Jaime Stephens (KBO) |
| Bird Habitat | Landbird community composition | Jaime Stephens (KBO) |
| | Landbird species abundance | Jaime Stephens (KBO) |
| Herbaceous Cover | Herbaceous composition | Kerry Metlen (TNC) |
| Fire History | Fire regimes | Kerry Metlen (TNC) |

* COA=City of Ashland; FS=US Forest Service; FSFHP=USFS Forest Health Protection; KBO=Klamath Bird Observatory; PNW=Pacific Northwest Research Station; SOU=Southern Oregon University; TNC=The Nature Conservancy

# Acknowledgements

Thanks to Chris Chambers, Marko Bey, Tom Greco, Kerry Metlen, Sara Jones, Darren Borgias, and Don Boucher for providing historical information and photos. Sara Jones graciously provided information, contact, and photos used in the case study. This case study is made possible by funding from the World Economic Forum and was edited and managed by Rebecca J Cole and ETH Zurich's Crowther Lab.
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