California's Wildfire Resilience Program – 2022 Budget Report

This report provides an overview of California's Wildfire Resilience investments through March 1, 2023, a program-by-program description of the 40 programs these investments fund, examples of recent impacts from each of those programs, and an interactive table that shows the status, location and description of each of the nearly 1,200 projects already completed or underway. This report does not cover California's significant investments in wildfire response, which include firefighters and equipment.

This report can be viewed on an interactive website by navigating to https://wildfiretaskforce.org/californias-wildfire-resilience-program/

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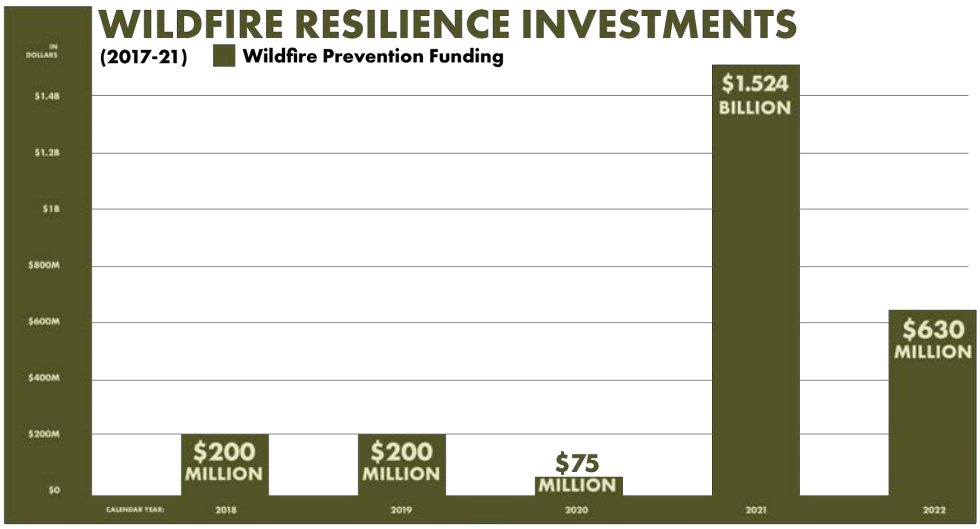
Program Overview

Executive Summary

California has undertaken an urgent paradigm shift to dramatically scale up wildfire resilience activities to address the growing wildfire crisis. Preventative wildfire resilience efforts such as prescribed burns, strategic fuel breaks and home hardening alter a fire's behavior and can help both communities and wildlands survive wildfires.

In addition to resilience projects, over the past two years, California invested in workforce development, regulatory efficiencies, regional coordination, improved science, and wood products businesses. This extensive response helped establish a structural foundation that is needed to sustain robust wildfire resilience. Additionally, California fine-tuned business practices for contracting, grants, and environmental oversight processes to get resources on the ground quickly.

California's unprecedented three-year, $2.7 billion commitment to wildfire resilience is already protecting California's watersheds, wildlands, and communities. In 2018, California committed $200 million annually to support wildfire resilience programs. In 2021, wildfire resilience investments surged to a three-year $2.7 billion investment. This included $1.5 billion in 2021, $630 million in 2022 and an anticipated $664 million in 2023. This report does not cover California's significant investments in wildfire response, which include firefighters and equipment.



These investments span 40 programs implemented through an "all hands-on deck" approach by 22 different departments. The State shifted business practices to quickly turn these resources into real world projects. In less than two years, this funding launched nearly 1,200 wildfire resilience projects throughout the State.

The 2022 fire season demonstrated that California's unprecedented investment in wildfire resilience and improved tactical suppression tools can dramatically limit the damage and devastation of wildfires, even in the age of climate change.

Although California experienced similar drought and heat extremes in 2022 as seen in previous devastating fire seasons, and there was a larger total number of fires than the previous year, the 2022 fire season yielded a fraction of the devastation. In 2022, 362,000 acres burned and nearly 800 structures were lost compared to 2.5 million acres burned and 3,500 structures lost in 2021, and 4 million acres burned, and 11,000 structures lost in 2020.

This improved trend was due to more than the luck of the weather. California's unprecedented investment in wildfire resilience resulted in a surge of activity and projects across the State that help moderate wildfire behavior. These fuel reduction projects paired with CAL FIRE's expanded fast suppression response, like helitankers and helicopters with nearly the water capacity of a C-130, enabled most fires experienced in 2022 to remain small. For example, several fires that were initially predicted to be megafires, such as the Electra Fire in Amador County or the Oak Fire in Placer County, encountered recent fuel reduction projects in their initial hours and were quickly contained.

Collaboration Through the Task Force:

The California Wildfire and Forest Resilience Task Force (Task Force) was established in 2021 to advance an integrated approach toward creating landscape and community resilience. The Task Force's purpose is to deliver on the key commitments in the California Wildfire and Forest Resilience Action Plan (Action Plan) – a comprehensive framework for establishing healthy and resilient landscapes and communities that can withstand and adapt to wildfire, drought, and a changing climate.

The Task Force helps ensure California's investments are coordinated with federal and local programs. The Task Force and its work groups continued developing Joint Strategies in 2022 that set aggressive yet

achievable targets for critical components of the Action Plan. For example, California's Strategic Plan for Expanding the Use of Beneficial Fire highlighted key barriers to prescribed fire – including lack of access to prescribed fire insurance – and identified solutions to align efforts. The Administration worked with the Legislature to develop a plan to address this in SB 926 (Dodd, 2022), which created the prescribed fire liability program, a $20 million state program that covers damage liability of up to $2 million for permitted prescribed fire projects.

The Task Force provides more information on its activities in 2022 in its End of Year Report.

2022 Program Highlights

California's investments in Wildfire Resilience are already translating into tangible results:

On-the-ground projects

- CAL FIRE's Forest Health grant program has awarded more than 400 grants since 2021.
- CAL FIRE's urban forestry program grants will plant 37,000 trees over the next five years. One of the grantees, Plant Justice in Oakland, is employing formerly incarcerated individuals and members of other vulnerable communities to expand the urban tree canopy in the East Bay.
- California State Parks is improving wildfire resilience by reducing fuels and using prescribed fire in 42 parks statewide. In 2022 State Parks received 11 new fire engines and other equipment to increase on-the-ground treatment acreage. These investments, and planning efforts are creating the foundation for ecological fire resilience into the future.
- The California Department of Fish and Wildlife has invested in 70 wildfire resilience projects covering 84,000 acres of unique habitat in California. This included installing 32,000 yards of fencing to enable prescribed grazing across these lands and re-seeding more than 4,000 acres of critical habitat that had been burned.
- The Santa Monica Mountains Conservancy invested in dozens of projects, including a Highway 101 ignition prevention program, replacing invasive fire-prone grasses with native oaks which are both more resilient to wildfire and capture carbon emissions.

Foundational investments

- Investments in science and monitoring have resulted in 11 new University of California Wildfire Science advisors being stationed throughout the State.
- California's remote sensing investments enabled matching grants from the U.S. Geologic Survey to collect approximately 30 million acres of new LiDAR (Light Detection and Ranging), which uses a remote sensing method to make a detailed 3-D map of the current topography and vegetation for every high fire risk region of California.
- The Regional Forest and Fire Capacity Program was able to expand to 13 large-scale regional collaboratives, now ensuring every fire-prone region of the State has staffing and expertise to coordinate and develop wildfire resilience projects across federal, state, local, tribal and non-profit partners. For example, the partnership in Los Angeles and Riverside counties launched the first indigenous Conservation Corps and will accelerate wildfire resilience projects across 250,000 acres.

- Investments in regulatory reform have enabled the State and Regional Water Boards, and the Department of Fish and Wildlife, to fully synchronize permits into a consolidated California Environmental Quality Act (CEQA) review process called the California Vegetation Treatment Program (CalVTP). There are now 93 CalVTP permits underway (46 approved; 47 in process) covering more than 1 million acres of high fire risk areas. This enables wildfire resilience projects that do not qualify for emergency or exemption permits to complete CEQA review within several months rather than years.
- Investments in workforce development, like the new Forestry Corps branch of the California Conservation Corps, has enabled year-round fuel reduction and restoration work. The Forestry Corps helped recover 20 miles of burned trails throughout Big Basin State Park, enabling its reopening.

Lessons Learned

The speed of implementation for these near 1,200 projects is noteworthy. The initial $500 million in "early action" funding received in April 2021 was designed to surge activity quickly and put a foundation of wildfire resilience projects in place for the 2022 fire season. To move at the speed of the crisis, the Legislature allowed for no-bid contracting for wildfire resilience projects, shortening the contracting timeline from years to several weeks. State entities focused on investing in "shovel-ready" projects for the initial round of awards, meaning projects that had secured environmental reviews were approved. Departments also adjusted their grant processes enabling many grants to be awarded within a month of the appropriation. These shifts in state processes resulted in dozens of projects being ready during fire season 2021 and more than a thousand projects ready during fire season 2022.

Background

In 2020 and 2021, California experienced back-to-back devastating wildfire seasons. In just two years, more than 17,000 fires consumed nearly 7 million acres of California – an area the size of the state of Massachusetts. These fires decimated mountain communities including Grizzly Flats, Greenville, and Berry Creek, and forced well over a quarter of a million people to evacuate. Wildfires compound existing crises from public health to homelessness, straining the endurance of weary California communities.

Photo Credit: Tahoe Conservancy

For the first time in recorded history, in 2020, California experienced the first fire to exceed a million acres, followed in 2021 by the Dixie Fire, just short of a million acres. Fire behavior was unprecedented with flames larger than 20-story buildings, burning three miles ahead of the main fire, and for the first time in history, burning up and over the granite crest of the Sierra Nevada.

Most of these fires were in the upper watersheds of the Sierra Nevada, which sources 60 percent of California's water, exacerbating drought and mudslide conditions, creating a compounding cycle of climate catastrophes.

History of the Fire Crisis:

This historic, unparalleled crisis stems from two compounding factors: hotter, drier climate conditions colliding with century-old political decisions of over-logging and fire suppression that left California's forests weak and over-stressed.

Fire, like water, is an integral part of California's natural ecology. Many ecosystems have adapted to frequent fires that burn at low temperatures and help germinate seeds and return nutrients to the soil. California Native American tribes actively managed California's wildlands with cultural fire since time immemorial.

But a federal fire suppression policy that extended into the 1970s changed the structure of the forest and caused significant buildup of fuel, much of which must be removed before natural fire regimes can be restored.

Recent wildfires are far outside of their ecological norms. Much like a dam breaking and releasing pent up water, current fires are burning 100 years of woody material in several weeks rather than several decades. Unprecedented drought and heat dry that fuel and the result is catastrophic wildfires that decimate any ecologies and communities in their path.

Solving the Fire Crisis:

Although wildfires are growing more extreme, a fire-resilient California is within reach. Science-based adaptations are proving effective. While fires are not going away, adaptations across wildlands, around communities, and within communities are changing how and where fires burn, improving the safety of communities and ecosystems. Fires will still burn, but these adaptations will help return fire to its ecological role, even in an era of climate change.

Photo Credit: Tahoe Conservancy

Success Story – Sequoias

California's investments are driving federal and non-profit investments to California. For example, the State joined the California Giant Sequoia Land Coalition, a collaborative of State, federal, tribal, and non-profit land stewards who worked to expediate protection of the most critical old growth Sequoia groves in California. In the 2020 and 2021 fires, an unprecedented 11,000-year-old growth of monarch sequoias were killed. The death of old growth sequoias stands is rare – in the last 800 years, the loss of less than five stands of old growth sequoia have been recorded – with between a dozen to several hundred trees in each of the incidents. Hence, when two catastrophic fire seasons destroyed 11,000-year-old growth trees – roughly 20 percent of the old growth sequoia population, California shifted into emergency mode. The California Giant Sequoia Land Coalition identified the groves in most urgent need of protection. California's investments expedited projects in these groves, federal partners declared an emergency and within a year, 36 of the most critical old growth groves in California were receiving protected from fire. When large fires came through these old growth groves in 2022, like the Mosquito Fire in Placer County or the Oak Fire in Yosemite, the fire burned at low intensity and these millennia-old monarch trees survived.

National Park Service scientist hikes into Redwood Mountain Grove to look at post-fire effects on giant sequoias. Photo by Daniel Jeffcoach, National Park Service

California's Approach to Wildfire Resilience

California's wildfire resilience investments span three core areas of resilience designed to modify a wildfire's behavior: Investments within communities like home hardening and defensible space, investments around communities like strategic fuel breaks, and investments restoring broad landscapes and watersheds, like prescribed fire. The program also invested in foundational areas that help increase the pace and scale of these activities. This includes workforce development, growing regional capacity and coordination, scientific monitoring and research, regulatory efficiencies, and developing businesses that utilize wood to help avoid burning slash piles.

On-the-Ground Investments

Within Communities

Home hardening and defensible space helps make homes less prone to ignition when fires are burning. Simple home improvements like mesh over vents on attics and double-pained windows prevent embers from getting into homes. Fire-resilient landscaping, called defensible space, keeps the worst of direct flames and heat away from homes during a fire. These steps dramatically improve a house's survivability in a wildfire. These individual actions are even more effective when neighborhoods do them collectively, thus preventing home-to-home ignition during a wildfire.

California's building codes and defensible space rules incorporate these standards and make communities more resilient to wildfire. For example, in the 2018 Camp Fire, the homes built after the 2008 Chapter 7A building code updates had a roughly 50 percent survival rate, while homes built before 2008 had a 10 percent survival rate. Millions of homes will require simple retrofits to achieve the higher standard.

Wildfire resilience investments within communities include:

- Education and outreach through the UC fire advisors
- Expanding the defensible space inspector program
- Launching a new home hardening retrofit program for lower income Californians
- Wildfire resilience grants to support home hardening and defensible space projects

These efforts complement a recent collaboration between CAL FIRE and the Department of Insurance to create insurance incentives and discounts for both homeowners and neighborhoods to encourage risk reduction activities like defensible space, home hardening and fuel breaks.

Around Communities

Strategic fuel breaks, wide long strips of thinned vegetation and forest, change the behavior of a fire by changing the fuel bed. This gives firefighters a tactical advantage during a fire fight. Fuel breaks enable firefighters to stage equipment, establish defensible lines, and create buffers along roads to help evacuation during a wildfire. During the2021 Caldor Fire, the network of fuel breaks around Pollock Pines and South Lake Tahoe helped save the communities. Firefighters saw flame lengths drop from 150 feet to 15 feet when the fire entered a shaded fuel break in Christmas Valley, enabling firefighters to approach the fire and keep it away from homes. Wildfire Resilience Investments in fuel breaks include:

- Wildfire Resilience Grants to communities and counties

- CAL FIRE unit fuel reduction projects
- CAL FIRE fuel reduction crews
- Forestry Corps, California Conservation Corps Fuels crews

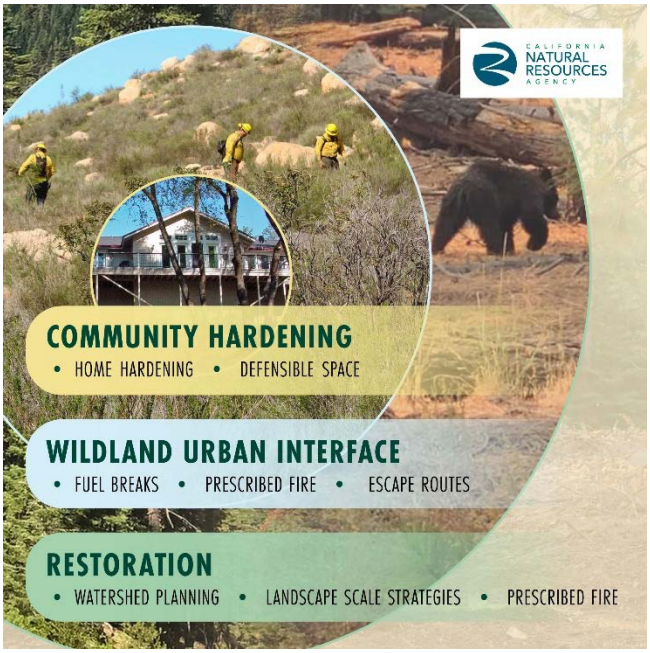
Across Watersheds and Wildlands

California's drought-stressed wildlands are at critical risk when catastrophic fires break out. High intensity wildfires, like the Dixie Fire, decimated the Feather River watershed, the headwaters of the State Water Project. The Sierra Nevada region has experienced more fire in the first two years of this decade than in any of the previous seven decades.

Resilience interventions for California's wildlands either restore native plants or remove excess fuel to the point that natural fire or grazing regimes can be restored.

But the mosaic ownership of California's landscapes complicate execution of these projects. The federal government owns 57 percent of California's wildlands, the State owns 3 percent, and 40 percent is held by private entities and tribes. Since fires do not pause at jurisdictional boundaries, California's wildfire resilience investments ensure that every landowner has the resources and coordination to establish cohesive, landscape-scale resilience, including:

- A large forest health grant program
- Wildfire resilience programs for State-owned land including State Parks and Department of Fish and Wildlife
- Grants for small forest landowners, who own 26 percent of California's forestland in small patchwork parcels
- A new grant program exclusively for California Native American Tribes



Foundational Investments

To sustainably achieve wildfire resilience at a large scale the State also needed to invest in the foundation for resilience. These investments include regional collaboratives, science and data, permit efficiencies, workforce development and wood product infrastructure.

Regional Collaboratives

The State is investing in regional collaboratives to drive statewide grants and programs to ensure fire resilience is cohesive and tailored to local conditions.

California's diverse ecologies, from the coastal redwoods to Southern California chaparral, all have unique natural fire regimes and therefore require a tailored approach. By investing in regional collaboratives and regional planning, local knowledge can help direct state and federal investments. The California Department of Conservation operates the Regional Forest and Fire Capacity Program, while State conservancies anchor the regional strategies and help develop more local collaboratives.

Science and Data

Achieving effective, long-term forest health and restoration during a dynamic environment of high-severity wildfire and climate change requires rigorous monitoring and robust scientific inquiry. State investments in science and data include:

- Spatial data investments in advancements like LiDAR
- Ground data investments like Forest Inventory Assessment Plots
- Data analytics tools like forest change detection
- Research grants to further scientific knowledge like the connection between forests and drought

Permit Efficiencies

To expedite environmental review for urgently needed vegetation management, California completed the CalVTP, a 20-million-acre environmental impact review, covering the non-federal, fire-prone land in California. This reduces the CEQA timeline from years to months for wildfire fuel reduction projects. The CalVTP also provides a CEQA platform for multi- agency permits including the Department of Fish and Wildlife and the State and Regional Water Boards. Although the initial wildfire resilience funding focused on "shovel ready" projects, many of the newer projects that either were too big or too complex to use an exemption, are relying on the CalVTP to quickly comply with multiple environmental regulations. Investments in permit efficiencies included:

- Hiring and environmental consulting firm to conduct CAL VTP project specific analysis
- Funding staff at the State Water Boards to fund synchronized permiting with CAL VTP
- Funding local air districts to support prescribed fire burn permits

Workforce Development

Grants to develop community college programs, professional certifications, and training will be crucial to ensuring a trained workforce is available to execute projects at a faster pace. Investing in local workforce programs helps ensure State investments in wildfire resilience translate into reliable local jobs and careers. Investments include:

- New CAL FIRE workforce development grant program
- California Forestry Corps program at the California Conservation Corps
- Hiring CAL FIRE fuels crews

Wood Products Infrastructure

We cannot achieve lasting wildfire resilience without major private-sector investments in forest management. A thriving market is essential to assure that otherwise non-merchantable material is not left in the forest to be pile-burned or complicate a wildfire. By creating an economic use of these products, the State will generate strong, sustained private investments in forest health. Investments include:

- Loans and loan guarantees for forest/wood sector businesses
- Feed stock aggregation pilots designed to stabilize the supply chain
- Subsidies for woody feedstock transportation
- Small business development grants

Program Reports

Goal 1 – Increase the Pace and Scale of Forest Health Projects

To meet the unprecedented challenges we face, California is significantly increasing the pace and scale of forest health and community resilience projects. The programs listed below are improving the health and resilience of the state's forested landscapes, including woodlands, grasslands, chaparral, shrublands, and related vegetation types that yield both ecological and community benefits. The programs are promoting healthy vegetation to improve climate resilience, reduce the risk of catastrophic wildfire, safeguard water and air quality, protect fish and wildlife habitat, enhance biodiversity, sequester carbon, improve recreational opportunities, and generate job and economic opportunities.

Forest Health Grant Program

Department: CAL FIRE

Program Description: CAL FIRE's grant program will continue to support forest health activities throughout the State and now includes dedicated funding for Tribes and post-fire reforestation and regeneration. Focused on implementation acres, treatments include reforestation, prescribed fire, fuels modification, pest management, and biomass utilization.

Program Impact: The Forest Health grant program has invested more than $394 million in 97 multi-landowner, landscape scale forest restoration projects. The funds are used for directly implementing forest treatments and have resulted in tens of thousands of acres treated across the state.

Resilience in Action: The San Mateo County Forest Health project involves forest fuels reduction treatments across approximately 445 acres at two county parks and Camp Butano Creek, a property owned and managed by the Girl Scouts of Northern California. The forests in these parks have high fuel

loads, rugged, inaccessible topography, and have experiences years of extreme drought, threatening nearby isolated mountain communities that have limited evacuation routes. The removal of brush, dense vegetation, and diseased trees throughout the project area is intended to improve growing conditions and resilience to drought, disease, and wildfire for the remaining forest.

Regional Forest & Fire Capacity

Department: Department of Conservation

Program Description: The Department of Conservation's Regional Forest and Fire Capacity (RFFC) Program supports local and regional efforts to assess the resilience of their forests and communities, identify forest health and wildfire prevention priorities, build local partner capacity, and develop a pipeline of shovel ready fuels reduction projects. With the passage of AB 9 (Wood/2021) and a sustained increase in funding, DOC has expanded the RFFC Program to nearly all fire-prone regions in California, each developing a long-range strategy for wildfire resilience and a consistent pipeline of high-value projects that can be executed in the next several years.

Most recently, this increased funding has enabled the Regional Forest and Fire Capacity program to award additional block grants to expand further across Los Angeles County in the Upper Los Angeles and San Gabriel Watersheds as well as the Inland Empire in Riverside County. The Department is also working to provide coverage for eastern Sonoma County in the North Bay watershed.

Program Impact: In 2022 the Regional Forest and Fire capacity program increased funding for its 11 block grantees and executing two new block grants for the Los Angeles and San Gabriel River Watersheds and the Inland Empire in Riverside County, in turn supporting more than 100 subgrants and contracts for fire resilience activities, coordinating more than 200 organizations and 500 practitioners, cooperating with or co-managing projects with 30 California Native American Tribes, providing training and workforce development opportunities to nearly 1000 Californians, and accelerating at least 250,000 acres of forest health and fuel reduction projects toward shovel-readiness.

Regional Forest and Fire Capacity Program was able to scale from a phase 1 pilot program in specific areas throughout the State to now cover every fire-prone region in California expanding programs in Lake, Napa, Colusa, Yolo, Solano, Glenn, Tehama, Shasta, Southern Siskiyou, Los Angeles, Riverside, and Orange Counties.

Funds also:

- Developed critical capacity to enable local wildfire resilience partners to scale up their impact to overcome systematic and structural barriers in implementing resilience goals.
- Finalized phase 1 Regional Priority Plans in the California North Coast watersheds, Inland Empire, and the Santa Monica Mountains, and Greater San Diego as well as many other local collaborative planning efforts, producing 367 high priority projects through partnerships with at least 100 local organizations across Southern California.
- Supported the launch of the North Coast Regional Resilience Plan, adaptive prioritization and planning framework, and a pipeline of projects with more than 1000 priority projects in different stages of readiness integrated with a novel project tracking and reporting tool.

- Facilitated block grants to implement Regional Priority Plans in the North Coast, Sierra, Central, and Southern California regions.
- Completed more than 50 scalable demonstration projects, advancing restoration, reforestation, workforce, biomass utilization, mapping, and modelling throughout the state.
- Launched indigenous conservation corps programs in San Diego and Los Angeles Counties.
- Execution of a unique bilateral agreement between the Tahoe Conservancy and Washoe Tribe to coordinate and consult on wildfire and natural resource issues within the greater Tahoe region.
- Expanded a prescribed fire association mentorship and support program, empowering and expanding prescribed fire expertise, resulting in the development of several new prescribed burn associations.

Supported a tribal capacity grant program implemented by the Indigenous Stewardship Network, an indigenous-led non-profit organization that supports the expansion of indigenous-led forest and fire cultural practices. Other activities funded to date and those currently under consideration include:

- Continuing RFFC regional collaboration, planning, and prioritization efforts
- Leveraging RFFC funding with grant applications
- Organizational development to build capacity in the area of forest and fire project development, funding, and implementation
- Development of shovel-ready forest and fire resilience projects
- Expansion of Prescribed and cultural fire training and networks
- Working with the USFS and implementing 3rd party NEPA projects
- Assisting Fire Safe Councils with community protection project identification, prioritization, funding, and implementation
- Developing invasive pest control programs for major pests such as Gold-Spotted Oak Borer

Further activities planned through 2024 include:.

- Completion of Regional Priority Plans in all regions
- Continued growth of Prescribed Burn Associations and prescribed fire training
- Expansion of shovel ready project development
- Growth of Indigenous Stewardship Network
- Strengthening of formal governance in regions

State Parks Wildfire and Forest Resilience Program

Department: State Parks

Program Description: California State Parks is building a more wildfire-resilient State Park System through fuels reduction, prescribed fire, pest management, hazardous tree management, facility protection and improved wildfire preparedness. State Parks has amplified this work by collaborating with public and private conservation partners.

Program Impact: In 2022, the first full year of implementation of the Wildfire and Forest Resilience Program (WFRP), State Parks greatly expanded its capacity of prescribed fire activities while also implementing critical fuels reduction projects to actualize the benefits of this investment in wildfire resilience statewide. Notably, State Parks recruited and trained additional staff, acquired much-needed support equipment, and completed and started to scale up prescribed burn activities and support future wildfire resilience efforts on state parks. State Parks expanded partnerships with collaborators such as Parks California, Native American Tribes, Resource Conservation Districts, and others.

In 2022, State Parks conducted fuels reduction and/or prescribed fire activities at 42 State Park units throughout the state — from the far northern redwood forest parks near the Oregon border, along the central coast, in the Sierra Mountains, and down to the southern sky island forest parks near the Mexico border.

Figure 12 Broadcast burn as a prescribed fire activity at Humboldt Redwoods State Park.

Figure 13 Pile burn as a prescribed fire activity in State Parks Sierra District.

Resilience in Action: State Parks Wildfire and Forest Resilience Program has:

- Partnered with the Native American Conservation Crew at Cuyamaca Ranch State Park to provide local Native American youths on-the-job work experience in fuels management and reforestation work while incorporating cultural education and learning labs.
- Prepared a1,300 acres prescribed burn for the South Grove of Giant Sequoias at Calaveras Big Trees State Park, in coordination with the California Giant Sequoia Coalition. State Parks is coordinating with CAL FIRE, USFS, and NPS for this project and expects to burn in Fall 2023.
- Purchased eleven fire engines and is training additional State Park's staff to expand State Park's prescribed burn program.
- Also purchased 12 Burn Boss Air Curtain Burner incinerators, enabling year-round slash pile removal.

Figure 14 Native American Conservation Corps crew at the Cuyamaca Rancho State Park.

Figure 15 Pile burn as a prescribed fire activity in Trione-Annadell State Park.

CDFW Wildfire Resiliency Initiative

Department: Department of Fish and Wildlife

Program Description: The California Department of Fish and Wildlife (CDFW) Wildfire Resiliency Initiative has increased the pace and scale of vegetation management and fire-adapted native plant restoration activities to promote resiliency on CDFW lands. Projects are aligned with the implementation framework known as Maintenance, Adaptive management, Restoration, Capacity or MARC. Actions

include new and ongoing fuel reduction projects, native species revegetation, facility protection and preparedness, increased collaborations with Tribes and partners, and advancing workforce development. Monitoring efforts have begun to ensure best use practices are being applied within an adaptive management process.

Program Impact:

CDFW has initiated more than 70 fuel reduction and restoration projects on at-risk land across the state, many of which provide protection to Disadvantaged Communities. To date, fuel reduction has occurred on more than 84,000 acres, more than 32,000 yards of fencing has been installed to support future grazing, and 4,000 acres of previously burned habitat has been reseeded with native plant species.

Resilience in Action: Examples of the types of projects and activities CDFW is undertaking as part of the Wildfire Resiliency Initiative include:

- Reducing the buildup of dry, flashy fuels through grazing. More than 26,000 combined acres have been actively grazed at the North Carrizo Ecological Reserve, Yolo Bypass Wildlife Area and Butte Valley Wildlife Area, Santa Rosa Plain Vernal Pool Ecological Reserve, Calhoun Cut Ecological Reserve, and Rancho Jamul Ecological Reserve.
- Removing excess vegetation around the perimeters of Pilgrim Creek Ecological Reserve's 121-acres of riparian and coastal sage scrub. This protects the site and adjacent properties, including Camp Pendleton and residential developments.
- At the Slinkard/Little Antelope Wildlife Area in Mono county, 3,572 previously burned acres have been seeded with native bitterbrush, sagebrush, perennial grasses, and forbs (>12,000 lbs. of seed) in partnership with California Deer.
- At Pine Hill Ecological Reserve, 7 acres of dense shrubs have been cleared along the property boundary, which borders a residential area (see video).
- At Butte Creek House Ecological Reserve, previously burned by the Dixie Fire, CDFW was able to quickly construct beaver analog dams to slow the flow of water and perform contour falling to reduce erosion (see video).
- At Daugherty Hill Wildlife Area, 165.5 acres of fuel breaks were cleared with another 273.8 acres planned for 2023.
- At Santa Rosa Plateau Ecological Reserve, 1,780 acres of fuel breaks, invasive species removal and native species revegetation were completed at Santa Rosa Plateau Ecological Reserve.
- Near the Darrah Springs, Crystal Lake and Mount Shasta Hatcheries, 20 acres of defensible space was created to provide protection from catastrophic wildfire.
- At Cosumnes River Preserve (CRP) 450 acres of riparian forest has been thinned of decadent vegetation using hand crews, mechanical equipment, and where appropriate, prescribed herbivory, creating a more natural mosaic of vegetation, and reducing the risk of fire carrying through the riparian area. This project is being coordinated with other stakeholders in the CRP, increasing the impact of wildfire funds being spent.

- At Elkhorn Slough Ecological Reserve approximately 16 acres of eucalyptus trees have been removed from high ignition risk areas, including along roadways and near structures.
- At Mendota Wildlife Area 2,206 acres of fuel treatments were completed. Treatments included mowing access roads, creating, and maintaining fire breaks, and tree trimming.
- At Los Banos and North Grasslands Wildlife Areas, 4,260 acres of fuel reduction activities has taken place. Treatment activities have included: mowing access roads, discing firebreaks, treating invasive species, and clearing vegetation around powerlines, and perimeter roads. In addition to fuel reduction work, 2 acres of pollinator friendly native species were established.
- At the Bolsa Chica Ecological Reserve, 150 tamarisk trees were removed.
- At the Hallelujah Junction Wildfire Area, 3,000 acres burned by the North Fire in 2020 are being restored. 1,600 bitterbrush plants were installed in different treatments to evaluate the best method for reintroducing native plants to the burned area. Sagebrush seeding is taking place across the burned acreage as well. The reintroduction of native shrub species will help to slow the proliferation of invasive grass species and help promote a longer fire return interval on the landscape.
- In addition to localized actions, CDFW has initiated several state-level contracts that support regional projects including boundary surveys, CCC work crews, and cultural resources surveys.

1: Fire Break along Roadway in CDFW Region 6

Prescribed Fire & Hand Crews & Contract Counties

Department: CAL FIRE

Program Description: Restoring ecological fire is one of the fundamental pillars of California's wildfire resilience strategy. CAL FIRE has established dedicated fuel reduction and prescribed fire crews to increase the amount of prescribed fire on the landscape. CAL FIRE leverages additional private and government crews as available to enable prescribed fires to be a more dominant tool for fuel reduction.

Program Impact: In June of 2018 CAL FIRE received funding for six Fuels Reduction Crews dedicated to prescribed fire and fuels management. Governor Newsom's budget increased the program to 10 full-time Fuel Reduction Crews.

Fuel Reduction Crews are CAL FIRE region resources and interface directly with localized personnel on fuels reduction projects. They focus on hazardous fuels reduction techniques including prescribed burns, hand and mechanical fuel reduction, fire planning, and fire prevention education with an emphasis on improving public health and safety while reducing wildfire potential to California communities and forests.

Resilience in Action**:**

- In 2022, the Santa Barbara County Fire Department completed more than1,000 acres of fuel reduction with these resources. This was accomplished on three projects including 969 acres of broadcast burning on the Spaulding-Midland VMP, 30 acres of right-of-way clearance on the Alisal Road Project, and 12 acres of pile burning on the Painted Cave Community Defensible Space Project.
- The Spaulding-Midland VMP Project utilized prescribed fire to reduce the age class of the vegetation and remove heavy ground fuels associated with drought stressed Oak Woodland. This project located in the foothills below the Figueroa Mountain Recreation Area will help to reduce the threat of catastrophic wildfire that would affect Midland School, the adjacent Los Padres National Forest, and the residential community of Woodstock Estates. The treatment will also use the ecological benefits of fire to improve forest health in the area.
- The Alisal Road Project consists of four miles of roadside hazardous fuel reduction along Alisal Road. This road provides critical access/egress for multiple homes and properties located in SRA lands near the City of Solvang. Vegetation was selectively hand cut and chipped up to 20 feet on both sides of the road. Flammable chaparral was removed, flashy fuels were weed whacked, and trees were limbed up with ladder fuels removed. Overhanging branches were removed to increase access for tall vehicles. Dead trees were removed that were close to the roadway. Work was performed by hand crews using chainsaws, weed whackers, and chippers.
- The Painted Cave Community Defensible Space Project included multiple fuel reduction treatments surrounding the small community of Painted Cave. The Direct Award funding was used to complete 12 acres of pile burning on the Painted Cave South Fuel Break treatment. This WUI fuel break protects more than 100 homes by providing additional separation from dense chaparral fuels beyond the minimum defensible space requirements.

The Williams Ranch fuel reduction project in Shasta County was initially developed in 2020 to treat approximately 4,480 acres over a 10-year period. This project aims to reduce fuels and reintroduce fire back into the local ecosystem. This project includes manual fuels reduction and prescribed fire to meet several objectives including the reduction of catastrophic wildfire, increasing available water yield and returning native plant species to the area. The Shasta Trinity CAL FIRE unit, along with Fuels Reduction Crews, treated 130 acres as preparations for a prescribed burn that treated approximately 1,500 acres in 2022.

Prescribed Fire Liability Pilot

Department: CAL FIRE

Program Description: Achieving long-term forest and wildfire resilience requires scaling prescribed fire across California's fire-adapted ecosystems. In the last few years, California has removed significant barriers to prescribed fire, including reforming permitting for prescribed burns, training, and certifying prescribed fire managers ("burn bosses"), and investing in and equipping local prescribed fire collaboratives.

However, private insurers do not currently provide coverage for prescribed fires. The perceived risk of wildfire and the limited number of private prescribed burns in California make private prescribed fire insurance an unappealing business model.

The State established a $20 million prescribed fire liability fund to support and expand private prescribed fires throughout the State. Although property damage and escapes are rare (less than 1%) from a prescribed fire, a fund to cover the cost of potential losses incurred from a permitted prescribed fire partially limits the financial risk of private burners and incentivizes more permitted private prescribed burns.

Program Impact: SB 170 (2021 Budget Act, Chapter 240, Statutes of 2021) created and funded a $20 million Prescribed Fire claims fund for the State to establish a limited fund as a pilot project to cover certain losses incurred under a permitted prescribed burn that followed its burn plan. SB 926 (Dodd, Statutes of 2022) legally established the fund and provided parameters for access to the fund.

Resilience in Action: CAL FIRE, Department of Insurance, Department of General Services, the California Natural Resources Agency, and UC Wildfire Advisors, have been working with a wide array of prescribed and cultural burning stakeholders to develop the $20 million claims fund structure and function that will allow for private prescribed fire practitioners to access the fund to cover certain losses to facilitate more private burning. The program is launching in the spring of 2023.

Tribal Engagement

Department: CAL FIRE

Program Description: Tribes play a crucial role in managing forest land. The Governor's Wildfire Resilience budget provided $40 million in funding for California Native American tribal governments to support tribal-led wildfire resilience efforts. The funds will support Tribes in managing tribal land holdings, implement and promote tribal ecological knowledge in wildfire resilience, and establish wildfire safety for tribal communities. The goal of the program is to deliver resources to California Native American tribes to support wildfire resilience in a way that is efficient, respectful, equitable and supports a more direct approach to getting State resources to valuable projects identified by tribes.

Program Impact: Initially, funds have been made available through CAL FIRE's existing Forest Health program. CAL FIRE has a tailored, fast and effective grant program for California Native American tribes to support wildfire resilience activities and projects. In the longer term, the funds will be utilized to establish an equitable and efficient process to get resources to California Native American tribes in a way that maximizes tribal autonomy and minimizes burdensome State processes and paperwork.

Resilience in Action: With the support of CNRA, Tribes were consulted regarding the specific conditions that should be included in the grant program. CAL FIRE has developed the Tribal Grant guidelines and the solicitation for applications is currently open and will make awards in the coming months.

California Forest Improvement Program for Small Landowners

Department: CAL FIRE

Program Description: Forty percent of forest land in California is privately owned with small non-industrial forest landowners representing 26% of the forest landownership in California. If neglected these patchwork plots of land, ranging from 20 acres to one thousand acres, could exacerbate a wildfire. The California Forest Improvement Program (CFIP) provides small landowners with technical and financial assistance for planning, reforestation, and resource management investments that improve the health and resilience of forestland since its establishment in 1978. This helps create a more contiguous healthy, wildfire-ready forest regardless of land ownership.

Program Impact: In the last two years, this program has:

- Entered into 108 grant agreements with small, non-industrial private forestland owners.
- Restored 5,700 acres of forestland.

Resilience in Action: The CFIP program recently adopted an Emergency Forest Management Plan (EFMP), a more streamlined approach to reforesting lands devastated by catastrophic wildfire. This program helped restore small family-owned forestlands after the Creek Fire near Shaver Lake and the Antelope Fire in Siskiyou County.

Overstory of fire resilient pine trees with an understory of highly invasive Scotch broom a species very prone to fire.

A portion of the property post-treatment.

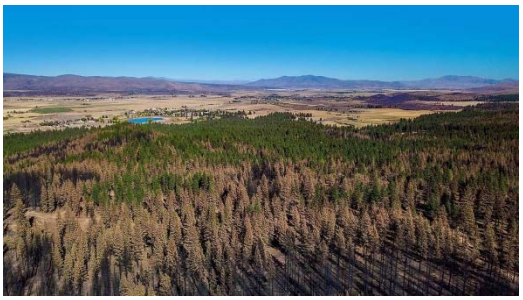
Project Implementation in High-Risk Regions – Sierra Nevada

Department: Sierra Nevada Conservancy

Program Description:

The Sierra Nevada Conservancy's (SNC) Watershed Improvement Program (WIP) stewards the 27-million-acre Sierra-Cascade region that contains 44 percent of the state's overall elevated or extreme fire risk. The Sierra-Cascade region sources 80 percent of California's water and more than 72 percent of the region is in a high-risk fire zone.

Effective at using science-based management and building community coalitions, the SNC's WIP supports efforts to restore resilience to the forested landscapes and communities of the Sierra-Cascade.



The burn severity of the 2020 Sheep Fire decreased as it burned into areas where the SNC, and others, funded Lassen Fire Safe Council forest-health treatments, helping to protect the city of Susanville. Creating shaded-fuel breaks in the wildland-urban interface that benefit both community and forest resilience is an example of the kind of multi-benefit projects prioritized by SNC's WIP.

The forest floor near a Quincy, CA neighborhood is marked by only mild fire effects, like burnt grasses and lightly charred tree trunks, two months after the deadly 2020 North Complex Fire. The area was treated under an SNC WIP grant that helped to create a 2.5-mile-long buffer of fire-resilient forests along Quincy-La Porte Rd. Fire suppression officials credited this buffer for the successful defense of all homes in the area.

A portion of the 2022 Oak Fire footprint. The green trees in the foreground are on the ranch of a private landowner with a long history of active management, including the SNC-funded Clarks Valley Wildfire Reduction Project. Elsewhere, the Mariposa County fire burned almost 20,000 acres in mostly damaging ways—destroying more than 200 structures and leaving high-severity impacts across nearly 60 percent of its footprint.

Watershed Improvement Program grants have proven their value in reducing wildfire risk in recent fire seasons. SNC-funded projects helped to protect Susanville from the 2020 Sheep Fire, the town of Quincy from the North Complex Fire, and Lassen National Park facilities from the 2021 Dixie Fire. These grants also had beneficial impacts during the 2021 Caldor Fire where SNC had supported a prescribed burn in the Caples watershed several years prior which helped save that forest when the Caldor Fire swept through. Grants also supported the Fire Adapted 50 project that protected communities like Sly Park and Pollock Pines during the Caldor Fire.

The SNC's current Wildfire Recovery and Forest Resilience Grant Program prioritizes the planning and implementation of forest health projects in high-risk regions to create more resilient landscapes, reduce wildfire risk, and accelerate recovery from recent wildfires.

Program Impact: Over the past two years the SNC has approved more than $36 million in grants for wildfire recovery and forest resilience projects. The 33 projects funded will complete wildfire resilience treatments on nearly 18,000 acres, replant more than 9,000 acres damaged by recent wildfires, and create thousands of acres of shovel-ready projects through fuel-reduction planning and prioritization efforts that will be conducted on approximately 565,000 acres across the Sierra-Cascade region.

The SNC opened a second $36 million round of wildfire recovery and forest resilience grants in June 2022. In response, SNC received approximately $89.5 million in project proposals. The SNC has completed its review of proposals and is moving forward with recommendations to award all remaining funds by June 2023.

Resilience in Action: The $20 million in 2021 Early Action funding provided to the SNC was distributed within three months of receipt to 15 shovel-ready wildfire resilience projects. Two of those projects are complete and are already protecting communities, watersheds and a hospital in the Sierra-Cascade region. Work is well underway on others, including projects that were impacted by the record-shattering 2021 wildfire season. Some, like the Thompson Peak Initiative-Bootsole Project in the Plumas National Forest, have been able to adapt treatment plans to take advantage of areas that did not burn at damaging high severity to build resilience.

Strategically located on a ridge separating the Merced River and Tuolumne River watersheds, the Wagner Ridge Fuel Break Project(video) expanded and widened a shaded fuel break to 400 feet. The fuel break will help with future firefighting efforts to keep a fire from crossing from one critical watershed to the other. The Wagner Ridge Fuel Break Project was funded in July 2021 with Early Action funding and was completed in Fall 2022.

Adjacent to homes and critical town infrastructure, including the Plumas District Hospital, the Quincy Wildfire Protection Project (video) should live up to its name by helping to protect people and property from wildfire. The rural hospital is located in the wildland urban interface in a very high fire severity zone and provides essential services to disadvantaged communities in the Sierra-Cascade region. The July 2021 grant was funded with Early Action budget funds and work on the ground was completed in Fall 2022.

Project Implementation in High-Risk Regions – Tahoe

Department: Tahoe Conservancy

Program Description: The Tahoe Conservancy is reducing wildfire risk to Tahoe communities and improving forest resilience. This work includes reducing flammable vegetation in the forests near homes, neighborhoods, and communities. It also includes managing forest vegetation and restoring meadows and streams to improve forest health and habitat so that these ecosystems are more resilient to insects, disease, wildfire, drought, and climate change. To get all this important work done the Tahoe Conservancy is building capacity by creating new jobs and training programs, using smart technology, and creating efficient government processes.

Aerial photo of south Lake Tahoe forested community.

Program Impact: Wildfire and forest resilience funding is helping the Tahoe Conservancy and its partners make progress towards the goals within the Lake Tahoe Basin Forest Action Plan. This includes completing and maintaining 25,000 acres of Tahoe's wildland-urban interface treatments by 2025, with approximately 11,000 acres remaining to reach this goal. The Tahoe Conservancy is also working closely with partners to fund strategic priorities, increase capacity, and improve technologies and science through various partnerships including the Tahoe-Central Sierra Initiative.

The Tahoe Conservancy aims to complete initial treatments on all 5,500 acres of its forested ownership by 2025 and has committed $6.5 million in wildfire funding so far towards this goal. The Tahoe Conservancy is also working with other State and local partners to complete priority work on other publicly owned properties, consistent with the Lake Tahoe Basin Forest Action Plan.

The Tahoe Conservancy has entered into several funding agreements for a total of $5.35 million for work on federal lands. This includes hazard tree removal and emergency fuel hazard reduction work on 1,500 acres of federally owned property adjacent to roads and trails in the Lake Tahoe Basin portion of the Caldor fire footprint. It also includes funding for 70 acres of treatments on federal lands in cross-jurisdictional community protection projects under the Conservancy's Good Neighbor Agreement with the USDA Forest Service, Lake Tahoe Basin Management Unit. Tahoe Conservancy staff are working with USDA Forest Service staff to incorporate federal land into future planned community protection projects to achieve more comprehensive and beneficial projects.

The Department of Conservation provided additional funding to the Tahoe Conservancy from the Regional Forest and Fire Capacity Program to increase capacity to treat forests and reduce hazardous fuels throughout the Basin. These funds are supporting multiple projects, including the Basin Community Wildfire Protection Plan update, which will collaboratively develop a priority project list for future work. The Tahoe Conservancy also provided a grant to the Washoe Tribe of Nevada and California to increase their capacity and complete culturally significant projects.

Forestry aides with the Tahoe Conservancy identifying project boundaries for future forestry treatment project in support of the Lake Tahoe Basin Forest Action Plan.

California Conservation Corps members conducting fuel reduction work on USDA Forest Service property.

Resilience in Action: Firefighters successfully defended Lake Tahoe neighborhoods from the Caldor Fire, without a single home lost in the Lake Tahoe Basin. Firefighters attributed previously completed wildland-urban interface treatments as a major contributor to their success. Wildfire and forest resilience funding is being used by the Conservancy to continue this work throughout other areas in Tahoe so that all neighborhoods and communities have the best odds of survival, no matter where a fire starts.

Project Implementation in High-Risk Regions – Santa Monica Mountains

Department: Santa Monica Mountains Conservancy

Program Description: The Santa Monica Mountains Conservancy prioritized wildfire resilience projects that proactively reduce the risk of wildfire, strengthen wildfire resilience, increase carbon sequestration, rally against the effects of climate change, and dedicate more resources to local community infrastructure.

Program Impact: In 2022, the Conservancy coordinated with partner agencies, non-profit organizations, local tribes, and other stakeholders to kickstart projects that performed one or more of the following types of wildfire resilience activities. Wildfire resilience activities included:

- Removing dry, hazardous, or non-native vegetation that poses ignition risk and habitat restoration
- Increasing the efficacy of wildfire response through emergency operations equipment and workforce development
- Ignition monitoring program
- Fire hardening at-risk structures

Conservancy wildfire resilience efforts, initiated in 2021 and sustained throughout 2022, addressed major wildfire hazards in the Santa Monica Recreation Area. State funding supported projects that mitigate hazards posed by fuel-vegetation, human actions, and at-risk structures. Investment in workforce development and capacity building in climate, fire resilience, and habitat restoration further enhanced wildfire prevention and emergency response operations. Ongoing project efforts will continue to reduce wildfire risk throughout the 2023 fire season and following years.

Native plants at Elyria Canyon Nursery to be installed at habitat restoration sites

Before and after photos of completed fuel reduction treatments (mowing) to reduce flammable, flashy fuels in strategic locations of the Santa Monica Mountains.

Resilience in Action: Fuel reduction along the ignition-prone highway 101 corridor continued in 2022, and as of January 2023, approximately 2,000 fire-resistant oaks have been planted at five key sites. In the coming years, fire-resistant oak habitat will replace the existent grassy fuel vegetation and serve as a natural fire buffer around the freeway. Funding for workforce development supported an expanded crew of seasonal firefighters in the Fire Division of the Mountains Recreation and Conservation Authority who received basic and advanced fire training classes, drills, and fuel vegetation removal.

Roadside vegetation management and oak habitat planting project to reduce ignition risk posed by nearby US Highway 101

New portable water pumps installed on daily patrol vehicles in conjunction with water tanks and fire hoses allow rangers to respond to fires on patrol

Project Implementation in High-Risk Regions – Coast

Department: State Coastal Conservancy

Program Description: The State Coastal Conservancy's (SCC) Wildfire Resilience Program supports projects that improve natural lands to reduce the risk of catastrophic fire in areas where people live. These grants accelerate on-the-ground activities that reduce the risks of wildland fires.

Program Impact: The SCC has awarded more than 70 grants to local governments, tribes, nonprofit organizations, and special districts from Trinity County south to San Diego. These projects have supported vegetation treatment, grazing, prescribed fire, and chipping programs. The projects have removed ladder fuels and created defensible space and shaded fuel breaks along the California coast.

SCC ran a solicitation for additional proposals during 2021 and received proposals requesting $88 million in funding. SCC now accepts wildfire projects proposals in an ongoing solicitation.

Resilience in Action: The SCC funded a grant to the Land Trust of Santa Barbara for grazing at the Arroyo Hondo Preserve. The Preserve was in the center of the Alisal Fire and the grazing was credited with saving the historic structures on the Preserve.

A grant to the to the Marin Municipal Water District will not only support fire but improve biodiversity. This grant will implement vegetation management projects identified in the Biodiversity, Fire, and Fuels Integrated Plan (BFFIP) in the Mount Tamalpais Watershed, and to reduce ladder fuels in the Marin County Parks Blithedale Summit Preserve.

Figure 32 Grant to the Land Trust for Santa Barbara County to implement prescribed herbivory to reduce fuel loads and create a buffer to prevent wildfire spread in the southern portion of Arroyo Hondo Preserve. These photos are from shortly after the Alisal fire; the grazed land is unburnt.

Figure 33 Grant to the to the Marin Municipal Water District to implement vegetation management projects identified in the Biodiversity, Fire, and Fuels Integrated Plan (BFFIP) in the Mount Tamalpais Watershed, and to reduce ladder fuels in the Marin County Parks Blithedale Summit Preserve.

Project Implementation in High-Risk Regions – Rivers and Mountains

Department: San Gabriel and Lower LA Rivers and Mountains Conservancy

Program Description: The Rivers and Mountains Conservancy's (RMC) Wildfire Prevention Grant Program serves to increase wildfire resilience and prevention, improve forest health, restore burned areas, and stimulate workforce development within its 1,600 square mile territory. It offers funding to eligible partners through three main categories associated with different geographic, ecological, and community needs:

1) San Gabriel Mountains and Foothills Fire Prevention Planning and Management.

2) Urban Wildlands and Hills Fire Prevention Planning and Management.

3) Forest Health: Fire Recovery, Response, Restoration, Education and Stewardship.

Priority areas under the program include invasive species management and native habitat revegetation, fuel load maintenance, fire prevention planning, defensible space improvement, and public stewardship building aimed at creating educated and fire-resilient communities.

Program Impact: In its first year and a half of operation, the Rivers and Mountains Conservancy's Wildfire Prevention Grant Program has awarded more than $12 million in grants to partner agencies conducting wildfire resilience activities in the Los Angeles region—encumbering the entirety of RMC's Early Action Budget funds. In summer 2022, the RMC entered into a $2.6 million Collection Agreement with the USDA Forest Service to fund the implementation of more than 1,400 acres of hazardous fuels reduction and invasive weed removal in the Angeles National Forest.

Resilience in Action: The RMC's funding partnership with the National Forest Foundation (NFF) and the Angeles National Forest (ANF) was highlighted as a field tour at the February 2023 Southern California Regional Meeting of the California Wildfire and Forest Resilience Task Force. RMC's combined investment with both the NFF and ANF, exceeding $6 million, will treat nearly 2,500 acres of hazardous fuels across the San Gabriel Mountains over the next two years with work starting in late winter 2023.

This trilateral partnership is already serving as a model for future state-federal-private cooperative efforts to tackle wildfire resilience challenges in California, and RMC will continue to lead regional collaboration through its participation as a new grantee of the DOC's Regional Forest and Fire Capacity (RFFC) Program as of January 30, 2023. In complement to legislative funding, the RFFC Program will allow RMC to develop an equity-centered, spatially explicit portfolio of implementation-ready wildfire resilience projects across its territory and is already working with partners do identify high-priority targets to elevate for pilot funding. This plan will then be used to channel future state funding to the areas with the greatest need.

Figure 34. USDA Forest Service personnel describing progress on fuels treatment areas in the Angeles National Forest outside of Wrightwood, CA on Big Pines Highway under the RMC-NFF "San Gabriel Mountains Landscape Scale Wildfire Resilience Project".

Project Implementation in High-Risk Regions – San Diego River

Department: San Diego River Conservancy

Program Description: The San Diego River Conservancy is working to advance the objectives to strengthen fire resilience, including maintaining fire breaks and defensible space, fuel reduction, restoration, and procurement of new fire apparatus, emergency equipment, and fire trucks. These actions will enhance the management of fire-prone habitats using methods known to reduce the risk and intensity of fires, improve fire access roads, and provide for other fire and forest resilience activities.

Program Impact: Early action investments began with projects to create defensible space and fuel breaks and reduce mostly non-native invasive species in the cities of San Diego, El Cajon, and Santee. The County of San Diego Department of Parks and Recreation will focus on reducing fuel loads on more than 10,000 acres in its parks and preserves. In addition, the Cleveland National Forest is implementing activities for hazard fuel reduction and wildfire emergency preparedness in the headwater of the San Diego and Tijuana Rivers, including the relocation of a helicopter landing zone for access in this remote area. Furthermore, the Conservancy awarded more than $1 million to local Bands within the Kumeyaay Nation for wildfire resilience, vegetation management equipment and two new Type 3 fire engines (Brush Rigs) one to the Barona Band of Mission Indians and one for the Viejas Band of Kumeyaay Indians.

Through a grant to the Resource Conservation District (RCD) of Greater San Diego County, they have provided hazardous fuel reduction removal to hundreds of private landowners at no cost to disabled and low-income homes in the San Diego area. The project targeted landowners in the Wildland Urban Interface areas. Services provided include chipping and establishing defensible space around homes designated by CAL FIRE as high-fire risk zones in San Diego County.

The San Diego River Conservancy reduced its timeline from nine months to three weeks to get grants signed, and work started. As a result, projects were able to launch by Memorial Day 2021 and expedited project implementation by a full year. A regular budget appropriation beginning in July with a 9-month grant process would only have seen projects launch on Memorial Day 2022.

Resilience in Action:

United States Forest Service – Cleveland National Forest

The Cleveland National Forest's Wildfire Resilience and Forest Health project will reduce fuel loads across approximately 1,855 acres, 100 miles of road brushing and maintenance, and prescribed fire supplies. This project also includes conducting more than 700 forest stand exams which will protect sensitive resources and assist in planning future work to restore oak woodlands and expand forest management. Project sites within the Cleveland National Forest include the San Diego River, Sweetwater River, and Tijuana River watersheds.

The project also includes the construction of a helicopter landing zone and three 10,000-gallon underground water tanks to provide a local source of water to help reduce wildfire severity and improve the safety of visitors and first responders in this remote area. These improvements are located at Cha'chaany Hamuk Trailhead (formerly Three Sisters Falls Trailhead) in a remote area of the San Diego River's upper watershed. This multi-faceted project was designed to enhance the capability for wildfire suppression and rescue people within the High Fire Severity Threat Zone. To support this added workload, Cleveland National Forest will hire additional employees to ensure the protection of sensitive and cultural resources and surge staffing for prescribed fire.

Kumeyaay Diegueño Land Conservancy

Through the Kumeyaay Diegueño Land Conservancy, the Campo Band of Mission Indians, the Campo Fire Protection District, the Jamul Indian Village, the Manzanita Band of the Kumeyaay Nation, the Viejas Band of Kumeyaay Indians, and the Sycuan Band of the Kumeyaay Nation, will use wildfire funds to procure fire-related equipment during wildland fire events. These tribal reservations are designated by CAL FIRE as a very high Fire Hazard Severity Zone and cover more than 57,000 acres. The project will provide new fire vehicles and fire-related equipment such as skid steers with masticators to help reduce the risk of fire by implementing fuel reduction, vegetation management, defensible space, and fuel breaks targeting the removal of diseased, dead, and dying trees.

Native American Conservation Corp (Pilot Project)

The Colorado Desert District of the California Department of Parks and Recreation was the lead agency for this project. State Parks developed a two-year pilot program for local people to participate in training for fire and forest resiliency activities in San Diego County. The goal is to increase employment opportunities for local Native Americans with their respective tribes, State Parks, U.S. Forest Service, or other local organizations.

This pilot project provides on-the-job training at Cuyamaca Rancho State Park in basic wildland fire, chainsaw use in the wilderness, basic first aid and CPR, GPS training, plant identification, and traditional ecological knowledge. In addition to State Park's leadership, other Conservancy partners assisted in project implementation, including the Kumeyaay Diegueño Land Conservancy, Cleveland National Forest, Resource Conservation District of Greater San Diego County, local Tribal Elders, and San Diego Canyonlands. After participants complete training, some individuals will return to their tribal communities to work, and others have received opportunities to work on fuel crews for State Parks and neighboring tribes.

Forest Legacy Program

Department: CAL FIRE

Program Description: The Forest Legacy Program protects important forest lands threatened with conversion to non-forest uses, like development. Protection of California's forests protects wildlife habitat, recreation opportunities, watershed protection, open space, and sustainable timber production. Intact forests also contribute significantly to the storage and sequestration of carbon.

Under this competitive grant program, CAL FIRE purchases or accepts donations of conservation easements or fee title of forest lands. The primary tool CAL FIRE uses to conserve forest lands in perpetuity is permanent Working Forest Conservation Easements. These conservation easements do more than just restrict development on a property, they protect forest values by concentrating on sustainable forest practices that provide both economic value from the land and long-term land stewardship.

Program Impact: Since the early action funding of 2021 and subsequent fire resilience budgets in 2021 and 2022 Forest Legacy has:

1. Entered into eight grant agreements worth $22.8 m with private forestland owners.
2. Protected 36,358 acres of forestland.

Resilience in Action: **Pacific Union College, CAL FIRE and Land Trust of Napa County Working Together to Protect Angwin Forestland**

Pacific Union College (PUC), CAL FIRE and the Land Trust of Napa County announced a joint effort to permanently protect and manage more than 1,750 acres of forestland in Angwin, adjacent to the college's campus. This forest is part of a larger ownership in the Angwin area held by Pacific Union College for more than 100 years. It is one of the most significant forests in Napa County.

The land is owned by Pacific Union College (PUC) near its Angwin campus in the mountains northeast of St. Helena. The forest abuts Las Posadas State Forest and a preserve which supports significant wildlife habitats and rare plants.

Pacific Union College was considering selling its forest lands, but changed course when it learned about the conservation easement through the State's Forest Legacy Program. The conservation easement permanently eliminates the potential for residential, commercial and agricultural development on the land and creates a continuous corridor of protected land along the entire length of the eastern ridge above Napa Valley.

Post-Fire Reforestation and Regeneration

Department: CAL FIRE

Program Description: CAL FIRE's grant program will support forest health activities for post-fire reforestation and regeneration. This program was developed to meet the recommendations of the Forest and Wildfire Resilience Task Force's Reforestation report. Post-fire reforestation treatments include site preparation and post-planting maintenance that are directly related to reforestation. The intent of post-fire reforestation treatments is to reforest or restore forestland following catastrophic fire. Reforestation treatments include tree planting, installing tree shelters, site preparation, oak woodland restoration, invasive plant removal, and herbicide.

Program Impact: The projects will restore climate-resilient natural conditions prioritizing native species and a density and distribution of seedlings that address emergency climate conditions including increased fire and drought, consistent with the Governor's Wildfire and Forest Resilience Task Force's Reforestation Working Group.

Resilience in Action: CAL FIRE has developed the Post-Fire Reforestation and Regeneration grant guidelines and awards are anticipated in the spring of 2023.

Lewis A. Moran Reforestation Center

Department: CAL FIRE

Program Description: Seedbanks and reforestation are at maximum capacity in California. The demand for tree-growing operations have expanded dramatically over the last few years due to California's drought, tree mortality and devastating wildfires sweeping through the state. Originally established in 1921, The Lewis A. Moran Reforestation Center is being revitalized and expanded to play a prominent role in meeting California's reforestation needs.

The nursery makes seedlings available to state and private forestland owners as part of a long-term venture to support statewide reforestation needs, including the California Forest Improvement Program. In the state's continuing mission to meet growing needs, we are expanding operations to meet long-term vision for the state's restoration efforts.

This facility also holds the State Seedbank. This long-term repository contains more than 42,000 pounds of seed native to a broad range of areas and elevations in California. This seedbank contains the highest quality seedstock available and provides seed storage for a small fee to public and private landowners.

Program Impact: In the last two years, the Lewis A-Moran Reforestation Center has:

- Upgraded facilities to expand seedling greenhouses.
- Funded grants to expand greenhouse space throughout the state, making room for the increasing demand for seedlings.
- Improved cones and seed collection by establishing a Seed Cooperative to share seed/cone and reforestation resources across State, Federal, private and non-profit organizations.
- Established a long-term survey of cones.

Resilience in Action: Climate Adapted Seed Tool (CAST) — The Reforestation Center has been working with climate scientists and forest biologists to help better align planting stock with the expected climate stressors at the planting locations. Forest trees, even within the same species, are genetically different from each other and are historically catalogued by geographically mapped areas called seed zones. Seed transfer rules specify a geographic distance beyond which populations should not be moved. In an era of rapidly changing climatic conditions, foresters must match the climatic adaptability of seedlings to the climatic conditions of restoration sites. The Climate Adapted Seed Tool will greatly expand California's ability to match expected climatic conditions with the seedlings planted, to ensure forests are healthy and productive into the future.

Lewis A. Moran Reforestation Center forester tending to seedlings

Lewis A. Moran Reforestation Center seedling greenhouses.

Wildfire Resilience Block Grants

Department: CAL FIRE

Program Description: CAL FIRE created Wildfire Resilience Block Grants in 2022 to build local capacity while providing financial and technical forestry assistance to nonindustrial forest landowners. The power of this program comes from the regional partner's ability to set parameters for assistance that directly meet the unique needs of the landowners in their local region. As part of these grants, CAL FIRE also created and funded Emergency Forest Restoration Teams (EFRT) to quickly restore forestlands burned by wildfires, often funding them while the fire is still ongoing.

Projects under this grant:

- Make funding available through agreements with landowners to pay for specific, non-commercial ecological forest improvement and wildfire resilience practices.

- Provide technical assistance to promote information sharing and education on the full range of effective forest management practices and opportunities as well as forest management education and management planning.

Program Impact: This support for small forest landowners includes:

1. Eleven grant funded projects awarded, totaling more than $30 million.
2. More than12,000 acres planned for treatment.

- More than 500 individual landowners assisted.
- More than 500,000 seedlings to be planted.

Resilience in Action: The Dixie Fire ignited on July 13, 2021, eventually burning 963,309 acres in Plumas, Butte, Lassen and Tehama Counties. The fire caused significant damage and the destruction of communities and ecologies. Half the fire burned with a tree mortality of 90 percent, creating landscape conditions without the potential for natural regeneration, susceptible to type conversion, erosion, and with residual hazardous fuels.

CAL FIRE awarded an $8M grant to the Feather River Resource Conservation District to formulate an Emergency Forest Restoration Team (EFoRT) in early 2022 to address this unprecedented need. The EFoRT is working with NIPF landowners to provide technical assistance and implement post-fire restoration activities across 2,558 acres. They are providing rapid assessments, securing permitting, and creating an implementation plan to satisfy restoration goals. EFoRT will ultimately implement these forest management plans.

California Vegetation Treatment Program (CalVTP) Environmental Impact Report

Department: Board of Forestry and Fire Protection

Program Description: Communities raised concerns that the CEQA environmental review process was slowing down their ability to launch critical wildfire fuel reduction projects. The California Vegetation Treatment Programmatic Environmental Impact Report(CalVTP) is an environmental impact review covering 20-million-acres of the non- federal, fire-prone land in California. The CalVTP enables efficiencies in the CEQA process that can reduce review timelines from multiple years to just months.

This approach reduces redundancies without sacrificing environmental quality by allowing project sponsors to build on known and verified environmental analysis as they begin their site-specific environmental review for individual projects.

Partner departments like the State and Regional Water Boards and California Department of Fish and Wildlife collaborated with the Board of Forestry and Fire Protection to ensure their environmental standards are reflected in the CalVTP, creating a streamlined environmental review process for approvals needed from those agencies.

CEQA exemptions are still used for projects that qualify. Large or more complex use the CalVTP to achieve their environmental compliance.

Once the site-specific environmental analysis is complete and approved under the CalVTP, it is valid for up to ten years, allowing multiple rounds of vegetation treatment and maintenance using the same environmental document.

Program Impact: To help ensure consistent and easy use of the new streamlined CalVTP process, the State hired an environmental consulting firm to conduct the Project Specific Analysis (the application required by the CalVTP). This helps ensure that local foresters have support as they get acquainted with a new environmental process. These completed examples will help future applications be prepared faster and more efficiently at a reduced cost.

As of April 2023, 46 CalVTP projects have been approved and another 47 are underway, totaling 93 projects utilizing this expedited tool. These environmental reviews have been coordinated with five CDFW regions and four USFWS field offices as well and the California Coastal Commission and the State Water Resources Control Board and various Regional Water Quality Control Boards; each agency coordination effort was approached with the objective of streamlining consultation with that agency for future CalVTP projects.

Resilience in Action: The Alder Creek Sequoia Resilience and Post-Fire Restoration Project PSA/Addendum, proposed by the Sierra Nevada Conservancy and Save the Redwoods League, exemplifies the usefulness of the program EIR, even for very complex and multi-jurisdictional projects.

In addition to vegetation treatment, the project included road repair and road decommissioning, which were related to vegetation treatment, but not covered in the CalVTP. These activities were addressed in an addendum, which was efficiently integrated with the project specific analysis. Consultation with USFWS and CDFW was accelerated by leveraging the education that had been provided and processes that had been established for other approved CalVTP projects. In total, the project specific analysis and addendum were finalized within 3 months, a process that previous would have taken at least a year.

Vegetation Treatment Water Quality Permitting

Department: Water Boards

Program Description: In July 2021, the State Water Resources Control Board developed and began implementing a streamlined statewide waste discharge permit (Order WQ 2021-0026-DWQ) for projects covered by the Board of Forestry's Vegetation Treatment Program (CalVTP) Programmatic Environmental Impact Report. Projects that are found to be within the scope of the environmental impact report are automatically enrolled in the Water Board's permit without additional application process and at no-cost to the permitees. Water Board staff have also added guidance for permitees and the public to the Water Board's program webpage. State Water Board staff are continuing to improve implementation by developing guidance information for the Regional Water Quality Control Boards, template communications for permittees and by providing technical support to permitees.

Program Impact: The waste discharge permit leverages the CalVTP Programmatic Environmental Impact Report. This made the CalVTP a fully streamlined permit with no additional paperwork or fees, while still providing critical protection to California's water resources.

Resilience in Action: The Water Boards: The State and Regional Water Boards were able to provide recommendations to the San Jose Water Company (SJW) about their CalVTP project called the San Jose Water Company Forest Health Program – P1. This project is designed to improve forest health, increase climate resiliency, and reduce the risk of wildfire. Lack of vegetation management, climate change, periods of successive drought, and development in the wildland urban interface have contributed to substantial change in forested landscapes across Santa Clara County. This project is one component within a series of projects in the area as part of a landscape-scale wildfire resiliency effort.

The Water Boards advised SJW about specific Standard Project Requirements related to water quality based on the project's planned vegetation treatment activities. This project has now become certified under the CalVTP process with just over 1,900 acres to be treated. The comment review process allowed the Water Boards to work together and share regional expertise, leading to sensible recommendations that contribute to both wildfire prevention and water quality protection.

Goal 2 – Strengthen Protection of Communities

More frequent, larger, high-severity wildfires threaten communities throughout California, with vulnerable communities located across a range of landscapes with diverse vegetation types. While better forest management will reduce wildfire risk in California's forested regions, California is also applying diverse strategies to protect much of the State's population that lives in cities and towns outside of forests. The programs listed below are hardening homes, buildings, and infrastructure, increasing defensible space and fuel breaks, and strengthening community planning and preparedness.

Wildfire Prevention Grants

Department: CAL FIRE

Program Description: CAL FIRE's Wildfire Prevention Grants Program provides funding for fire prevention projects and activities in and near fire threatened communities that focus on increasing the protection of people, structures, and communities. Funded activities include hazardous fuel reduction, wildfire prevention planning, and wildfire prevention education with an emphasis on improving public health and safety while reducing greenhouse gas emissions.

Building on the success of past fuel reduction work CAL FIRE works with grantees on strategically located fuel reduction projects in high wildfire prone communities throughout the State. These projects provide valuable education on wildfire mitigation action, preparedness planning, and hazardous fuel reduction projects that enhance public safety and slow the intensity of wildfires to provide firefighters an anchor point for suppression actions. CAL FIRE, with grantees, will complete these projects on a continuous basis, ensuring at least 45,000 acres are treated annually through this program. Wildfire prevention grants support the wildfire preparedness and mitigation activities of federal, state, and local agencies, Native American tribes, and private nonprofit partners.

Program Impact: CAL FIRE awarded $117 million in funding for 144 wildfire preparedness and mitigation projects across the State in FY 2021-22 appropriations. CAL FIRE is currently soliciting applications for the FY 2022-23 solicitation period which closed on March 15, 2023, where CAL FIRE will award up to $115 million from the FY 2022-23 appropriations.

Resilience in Action: The Wildfire Prevention Grants Program funded the South Eagle Lake Fuel Treatment project that was instrumental in protecting the Lake Forest Estates community during the Hog Fire. Lake Forest Estates is a mountain community surrounded primarily by private timberlands and recognized as a "threatened development" in the Lassen County Community Wildfire Protection Plan. It is situated upslope of Highways 44 and 36, with both heavily travelled corridors being the source of numerous fire ignitions. The treatment area extended from the community's western edge to Highway 44, or approximately 1.5 miles from the intersection of Highway 36.

The Hog Fire burned approximately one mile into the treated area before containment. The fuel reduction treatment in this area allowed firefighters to safely attack the fire from the ground with fire crews, fire engines, and bulldozers. The size of the fuel treatment (almost two miles long) allowed it to be effective not just to mitigate fire starts along the Highway 44 corridor, but also to contain this wind-driven fire that blew across the highway corridor.

Home Hardening Assistance

Department: CAL FIRE/OFFICE OF EMERGENCY SERVICES (Cal OES)

Program Description: California is developing the first home hardening assistance program, designed to help low-income high fire risk communities, collectively achieve home hardening and defensible space. The program is currently funded 75% through FEMA Hazard Mitigation Grant Program funds and matched 25% with state appropriated funds.

Assembly Bill 38, (Wood, 2019) directed the Cal OES to enter into a joint powers agreement (JPA) with CAL FIRE to develop and administer the California Wildfire Mitigation Program (CWMP). The program is designed to encourage cost-effective structure hardening and retrofitting and facilitate vegetation management, the creation and maintenance of defensible space, and other fuel modification activities. The legislation directed the JPA to develop criteria and a scoring methodology to prioritize financial assistance to areas and community based on vulnerability to fire, the impact of future climate risk and factors that lead some populations to experience a greater risk to wildfire, adverse health outcomes, or and inhibited ability to respond to a wildfire, including socioeconomic characteristics of the areas or communities that would be protected by financial assistance. Areas eligible for financial assistance under the CWMP include State Responsibility Areas (SRA) located within any Fire Hazard Severity Zone and Local Responsibility Areas (LRA) located within a very high fire hazard severity zone.

Program Impact: The CWMP is currently in the demonstration phase, being piloted in three select areas, Whitmore in Shasta County, Dulzura in San Diego County and Kelseyville-Riviera in Lake County. New pilot communities are also being considered for Tuolumne and El Dorado Counties. The lessons learned working with these pilot communities under the demonstration phase are being used to refine the program and build the program framework before expanding to additional areas within demonstration counties, and ultimately, across the state.

Resilience in Action: The CWMP Joint Powers Authority has been actively updating the program framework based on lessons learned while working with the initial pilot communities. A wildfire home assessment application and training program was developed and input from the pilot communities has instigated added features and improvements to the application and training program. The pilot communities have been actively conducting environmental review for their project areas. Procurement procedures for contracting for home retrofitting work are in development. The target for retrofitting the first homes in each of the pilot communities is anticipate for later this year.

Interagency staff from CAL FIRE and Cal OES discussing home hardening needs.

CAL FIRE Unit Fire Prevention Projects

Department: CAL FIRE

Program Description: Building on the success of past fuel reduction work, CAL FIRE continues working on strategically located fuel reduction projects in high wildfire prone communities throughout the State. New projects are started as soon as other projects are complete. CAL FIRE resources are committed to these projects that are vital to slow the spread of fires and provide anchor points for firefighters to implement suppression actions. Using the 2018 Strategic Fire Plan to guide CAL FIRE unit and contract counties, specific fuel reduction projects are formulated into a plan and implemented using the Unit Fire Prevention Projects funding.

Program Impact: These strategic fuel breaks and reduction in hazardous fuels reduce the severity of wildfires, while reducing the fire risk to vulnerable communities. Fuel breaks enable firefighters to approach a fire, take a stand, establish containment lines, and create safer public evacuation routes.

Resilience in Action: In 2022 the Santa Barbara County Fire Department completed 1,011 acres of fuel reduction as part of this program. This was accomplished through three projects including 969 acres of broadcast burning on the Spaulding-Midland project, a 30 acres of right-of-way clearance on the Alisal Road Project, and 12 acres of pile burning on the Painted Cave Community Defensible Space Project.

Electra Fire: Pine Acres Fuel Break is a 180-acre fuel break in the 2,544-acre Pine Acres VMP. Located near Jackson on the north rim of the Mokelumne River which divides Amador and Calaveras counties. The fuel break was initially completed in 2003-2004 as a 300-foot-wide shaded fuel break and then was developed into a Vegetation Management Plan in 2005. It was maintained and improved again in both 2006 and 2011. It was expanded and maintained again in 2015 and 2019. The primary goal of the project was to create a shaded fuel break intended to support fire suppression and structure defense operations in the event of a wildfire coming out of the Mokelumne River Canyon. On the first four days of the 2015 Butte Fire, it did just that. Due to recent maintenance in 2021, it once again was able to be used to stop the fire from progressing into the communities during the 2022 Electra Fire.

Lake Shastina Fuel Break

Defensible Space Inspectors

Department: CAL FIRE

Program Description: Defensible space coupled with home hardening is essential to improve a home's chance of surviving a wildfire. By removing flammable vegetation and material around a home,

defensible space provides a safe space for firefighters to defend a home and reduces direct flame and heat on a home during a fire. The CAL FIRE Defensible Space Inspection Program has been in place for more than 60 years.

Inspectors not only enforce California's defensible space rules, but the inspectors also work with residents to help them understand what specific steps they need to take to create defensible space for their home. Wildfire resilience funding is essential to the program and adds inspectors to CAL FIRE's base program of nearly 95 Defensible Space Inspectors for 3 months each fiscal year.

Program Impact: In 2022, the legislature tasked the Board of Forestry to enhance and deploy the defensible space laws to include the new ember-resistance zone within the first 5 feet immediately surrounding the home.

Outreach and education to homeowners about these new standards has been crucial to helping homeowners implement the new requirements on their property. With the importance of defensible space inspections and home hardening assessments increasing, this funding allows CAL FIRE to hire each Defensible Space Inspector for a full 9-months, the maximum amount allowed for a temporary help Forestry Aide position. Coupled with other funding, CAL FIRE has added an additional 24 permanent Forestry Technicians and 28 Limited-term Forestry Aide positions to the field.

Resilience in Action: Statistics showed that during the 2022 Oak fire in Mariposa County, homes which were compliant with defensible space standards were 6 times more likely to survive an advancing wildfire. CAL FIRE inspected 83,714 homes for defensible space in 2021 and 194,176 in 2022. This number is a great representation of what additional resources can accomplish. By working the seasonal Defensible Space Inspectors for a full 9-months and adding permanent staff, CAL FIRE more than doubled the properties inspected. This engagement with homeowners gives them the opportunity to learn about the importance of defensible space and home hardening, and how to implement those mitigation strategies for their particular property. It also allows the property owner to ask a fire professional about other wildfire preparedness measures to take. It cannot be underestimated how important it is to have one-on-one in person collaboration between the property owner and the Defensible Space Inspector.

CAL FIRE Defensible Space Inspectors discussing defensible space and home hardening with homeowner.

Land Use Planning Program

Department: CAL FIRE

Program Description: CAL FIRE's Land Use Planning Program assists local governments (cities and counties) throughout California as they address the risk from wildfire by planning for both existing and new development.

Program staff work with local governments and CAL FIRE Units on topics ranging from Safety Elements of General Plans, development of Community Wildfire Protection Plans (CWPP), State/Local Hazard Mitigation Plans (SHMP/LHMP), Subdivision Review identifying communities at risk and providing recommendations on fire safety via Assembly Bill 2911 (Friedman, 2018), and assist communities to become recognized through the National Fire Protection Association's Firewise USA program. The CAL FIRE Land Use Planning Program resulted from Senate Bill 1241 (Kehoe, 2012).

The Office of the State Fire Marshal is partnering with the UC extension program and will deploy land use planners within critical cities and counties to support their wildfire preparedness activities and emergency plans.

Program Impact: The Wildfire and Forest Resilience funding augmented staffing to provide local technical assistance in community wildfire mitigation and land use planning. These staff helped increase the number of communities surveyed through the AB-2911 Subdivision Review Program. Additionally, these staff will assist CAL FIRE with the rollout of the new fire hazard severity zone maps to the counties with the SRA and cities with moderate, high, and very high fire hazard severity zones in the LRA.

Resilience in Action: The CAL FIRE Land Use Planning Program works with 56 counties in the SRA and 189 cities within the LRA with development of their Safety Element which includes policies, goals, and objectives that protect the communities from the risk of wildfire. The Safety Element of the General Plan will also link (attach or reference) other planning documents such as CWPPs and LHMPs as needed. Since the inception of the program, more than 150 safety elements have been successfully updated through collaboration with our program. Additionally, California has nearly 650 Firewise USA recognized communities throughout the State. This program has nearly doubled the number of communities in the last couple of years leaving CA number one leader in the nation. The Firewise program is a community volunteer-based program that outlines the efforts of the community members to organize and prepare for wildfire.

Land Use Planning and Public Education Outreach

Department: University of California Agriculture and Natural Resources (UC ANR)

Program Description: UC ANR's Fire Resilience Program aims to build community fire adaptation and resilience throughout California to save lives and protect forests, agriculture, food, and other vital resources. The program provides a point of connection for landowners, agencies, local governments, and community members to work together toward fire resilience. By having UC ANR advisors focusing on wildfire, this new team helps to enhance community wildfire planning, daylight best practices on community and state levels, and build community fire adaptation and resiliency throughout California.

The University of California Cooperative Extension (UCCE) has deployed a new team of fire professionals to help California's communities adapt and become more resilient to wildfires. This team works with California residents, landowners, agencies, local governments, tribes, and other organizations to reduce California's vulnerability to wildfires.

The advisors are conducting community-based research and outreach, translating research findings into public-facing materials, and conducting outreach to meet the needs of the local community. The program coordinator supports the new advisor and the existing Cooperative Extension advisor network to amplify and organize the teams for effective delivery and program evaluation.

Program Impact: These new fire advisors, the program coordinator, and the existing network of UC ANR advisors and specialists are working to:

1. **Enhance the use of prescribed fire** to reduce fuels, restore ecosystem function, improve forest and rangeland habitats
2. Develop **best management practices for fuel reduction** to improve treatment efficacy and reduce ecosystem impacts
3. Incorporate **home hardening** techniques to build and retrofit homes for wildfire resilience
4. Incorporate **defensible space standards** to reduce near-home fire vulnerabilities
5. Engage with local **planners** to promote wildfire resiliency and best management practices.

Success stories: The current team of advisors is working on many fronts. The three stories below illustrate impacts.

- The team is working locally to build community capacity around **prescribed fire** by providing workshops and hands-on, live-fire trainings and supporting and formalizing Prescribed Burn Associations (PBAs). Team members work regionally and across the state to support policy development for prescribed fire. The team is also conducting prescribed fire research to provide fact-based evidence for the restoration and management of fire-adapted landscapes.
- **Fuel reduction** is essential for protecting communities and restoring fire-adapted ecosystems. The Fire Team provides workshops to help landowners learn how to apply science-based management practices, find contractors, permit projects, and secure funding for non-commercial fuel reduction. Additionally, team members are working on testing treatment alternatives and understanding cost comparisons in different ecosystem types.

Permitting fuel reduction projects can be challenging. Yana Valachovic and colleagues published a guide to help landowners and project proponents navigate CEQA. The publication scales from single-property projects to community-scale, multi-jurisdiction forest fuel reduction projects. This publication has been widely utilized by state agencies, community groups, and land management consultants. See *Valachovic et al. (2022) Planning and permitting forest fuel-reduction projects on private lands in California. UC ANR Publication 8716. https://anrcatalog.ucanr.edu/pdf/8716.pdf.*

- **Education** is a cornerstone of the team's efforts. They work with California residents, landowners, agencies, local governments, tribes, and other organizations to reduce California's vulnerability to wildfires through one-on-one consultations and educational events. During 2022 the team delivered 47 home-hardening talks, had 60 media posts, and reached 25,097 people through these combined activities. Additionally, the team provided 15 training workshops and reached 8,864 people through these virtual and in-person events.

Fire advisor, Luca Carmingini, is testing the effects of irrigation on plant flammability at the UC South Coast Research Extension Center.

Fire advisor, Barbara Satink Wolfson, has been working with community members and the Central Coast Prescribed Burn Association to help increase opportunities for prescribed fire.

Yana Valachovic, Forest advisor, has been working with the Insurance Institute for Business and Home Safety on experiments to better understand how different building products, such as tempered glass windows, perform when exposed to fire from an adjacent building or near landscaping.

Goal 3 – Manage Forests to Achieve the State's Economic and Environmental Goals

Healthy forests provide a range of benefits, boosting climate resilience, increasing carbon sequestration, protecting water supply, improving air quality, cooling communities, providing habitat for wildlife, and supporting local economies. Accordingly, California's forested landscapes are a key component of the state's strategy to combat climate change, promote biodiversity, and support rural economic development. The programs listed below are accelerating solutions to combat climate change, protect biodiversity and build resilience through nature-based solutions.

Workforce Development (Forestry Corps Crews)

Department: California Conservation Corps

Program Description: The California Conservation Corps Forestry Corps program trains youth in a year-long program in forest resilience. Often recruiting from lower income or vulnerable communities, these young men and women sign up for a year of service and training. These fuel reduction crews assist local departments, cities, counties in completing priority fuel reduction projects to reduce wildfire risk in fire-threatened areas. Often elbow-deep in poison oak and working in long-hot conditions, Forestry Corpsmembers remove hazardous fuels to reduce wildfire risk and re-plants trees to recover after a fire, while gaining valuable work experience in the climate and green industries.

Program Impact: The Pomona Forestry Corps has contributed greatly to the mitigation of wildfire with their fuel reduction and fire recovery projects. Santa Fe Dam's nature center had an issue with overgrown pepper trees that could serve as ladder fuels, so the Pomona crew significantly reduced the fuel load on two acres of land. William S. Hart Park in Hollywood had a similar issue with oak trees and oleander before the Forestry Corps arrived and brushed another two acres of overgrowth. The Pomona crew assisted Big Basin State Park to reopen after the CZU Lightning Complex Fire by cutting and brushing along 20 miles of trail. Most recently, the crew has been reducing the amount of hazard trees and ladder fuels at Monrovia Canyon Park in the burn scar of the 2020 Bobcat fire. All Forestry Corps members have been trained in using chainsaws and most have completed S-212 training through CALFIRE BDU. There are plans for Forestry Corpsmembers to receive additional training from CALFIRE, including CALFIRE Hazmat First Responder Operational and 1C. Five Corpsmembers have transitioned into the center's fire crew so far; one Corps member received arborist training; and two Corpsmembers have been selected for Hotshot crews in California ahead of this fire season. Pomona Forestry Corps has allowed Corpsmembers to have an impact across the state and prepared them for fruitful careers in fire and forestry.

The Chico Forestry crew has been hard at to work in both the classroom and out on projects. Many Corpsmembers have completed a five-week utility arborist training through our building partnership with Butte College; to date, this course has been taught twice. The crew also has been able to receive Basic CALFIRE fire training on two separate occasions. This has enabled the crew to take part in planned prescribed fire incidents on the Big Chico Creek Ecological Reserve (BCCER) and in Chico's Upper Bidwell Park. The Big Chico Ecological Reserve is our Forestry Crew's main project partner. We have completed many project hours reducing fire hazard fuels and invasive plant species on the Reserve. The crew is currently conducting two spikes in the Big Basin State Park completing fuels work.

The Greenwood CCC Forestry Corps has treated more than 200 acres and removed more than 317 trees since July 2022 on projects at Greenwood, Tahoe, and Pollock Pines. During the summer, the crew was also assigned to several fires including the McKinney Fire, Mill Fire, Mountain Fire, Barnes Fire, and Mosquito Fire. They have also participated in several trainings including the CALFIRE 1C fire training, chipper safety training, flood training, basic chainsaw training, beginner tree climbing training, and basic and intermediate faller training. Most of the crew will be completing their Forestry Certificate from Lake Tahoe Community College in June 2023.

To further expand the California Natural Resources Agency's core commitments to embedding equity, environmental justice, and tribal affairs, a Greenwood Forestry Corpsmember served as the first CCC Equity Corpsmember (CCC-ECM) to support the development of a policy white paper on providing inclusive language in our Agency's operations, practices, and procedures.

Resilience in Action:

Monrovia Canyon Park before Pomona Forestry Corps set to work.

A corpsmember hauls two rounds, trying to keep up with sawyers cutting trees into moveable sizes.

A Crew Leader (left) explains tension and compression to a Corpsmember.

Chico Forestry Corps:

The utility line arborist training the Crewmembers received through Butte College is invaluable and opened pathways for employment with tree companies. The Corpsmembers who attended received Certificates of Training in OSHA-10, certified flagger, Electrical Hazard Awareness Program, and aerial rescue.

A Corpsmember holding line at a prescribed fire incident.

A Corpsmember performing an aerial rescue during arborist training.

Workforce Training

Department: CAL FIRE

Program Description: CAL FIRE offers grant funding through its Workforce Development Grant program to applicants seeking to increase California's workforce capacity in the fields of logging, fuels treatment, forest sector transportation, forest sector manufacturing, or other forest sector support services. Research and Development ancillary to the workforce development topics discussed may also be funded.

Program Impact: CAL FIRE has 20 grant agreements totaling $38 million with partners who are doing workforce training. These programs are offering training to 1,200+ participants annually in forest-sector fields including prescribed fire, forestry, firefighting, heavy equipment and logging operations, teacher education, and peer-to-peer business learning. Students leave these programs with qualifications that range from college degrees to fellowships, certificates, mentoring, and apprentice work experience. CAL FIRE is currently soliciting additional projects and has received broad interest in furthering workforce development training in forest-sector fields.

Resilience in Action: The Forestry and Fire Recruitment Program (FFRP) is a 510(c)(3) that provides career support to those who have been in, or are returning home from, California's Conservation Camps (i.e., "Fire Camp") and are interested in careers in the wildland and/or forestry sector. Their mission is to increase wildfire personnel from non-traditional and underrepresented communities, providing then with the training, skills, resources, and experiences needed to secure gainful, living-wage employment while providing immediate fire prevention services throughout California.

Fire Crews

Department: California Conservation Corps

Program Description: The California Conservation Corps operates more than two dozen wildland firefighting hand crews. These fire hand crews operate at 15 CCC locations across California. The CCC partners with CAL FIRE, U.S. Forest Service, Bureau of Land Management, and National Parks Service to provide hand crews to fight and prevent wildland fires throughout the state.

In 2021, the Legislature and administration approved funding for 8 permanent ("year-round") and 6 seasonal CCC-CAL FIRE crews. This partnership addresses the state's need for increased firefighting capacity and workforce development. The effect is two-fold: in the off season, greater fuels work is completed; and during fire season, there are more crews for fire and emergency response. Altogether, these crews work toward decreasing the impact of, if not preventing, catastrophic wildfires.

Program Impact:

In 2021, and per the Fire Resiliency package, the CCC onboarded the following fire crews:
Year-round: Delta (2), Tahoe (2), Los Piños (2)
Seasonal: Fortuna (1), Monterey (Watsonville) (1), Pomona (1), Redding (1), San Diego (1), and Ukiah/Willits (1)

In 2022, and per the Fire Resiliency package, the CCC funded the following fire crews:
Year-round: Los Piños (2*), Ukiah/Willits (2*), Monterey (Watsonville) (1), Pomona (1), San Diego (1), and Fresno (1)
Seasonal: Fortuna (1) and Redding (1)

*The second Ukiah/Willits crew and the two Los Piños crews have been delayed and are expected to be fully implemented in the spring of 2023.

Resilience in Action:

1. Between July 1, 2021, and December 31, 2021, the CCC had 46 Corpsmembers transition out of the CCC into jobs related to fire, forestry, or arborist-related careers.
2. 2021 – Together, these 12 crews went on 260 dispatches to a total of 166 incidents. They were assigned to these incidents for an aggregated 1,121 days. Corpsmembers from these crews had 191,071 emergency project hours. This does not count hours that were not invoiced (e.g., several single day fires that were extinguished within the regular workday).
3. 2022 – Together, the seven crews funded in 2022 went on 85 dispatches to a total of 66 incidents, so far in the current fiscal year. They were assigned to these incidents for an aggregated 253 days. Corpsmembers from these crews have 46,482 emergency project hours.

Tahoe crews 1 and 2 work to contain the Colorado Fire in Monterey County as the sun sets on the Pacific in January 2022.

Corpsmembers with San Diego 4 keep a close eye on a controlled burn during training.

Corpsmembers from Monterey Bay 1 fire crew prepare for their next task following a line cut during the annual readiness exercise.

A Corpsmember with Pomona 1 fire crew uses a drip torch during a burn pile project in San Bernardino County.

Urban and Community Forestry

Department: CAL FIRE

Program Description: The Urban and Community Forestry Program leads the effort to expand urban forests in California. From mitigating extreme heat, reducing greenhouse gasses, and improving local air, soil, and water quality, to providing an environment better for mental and physical health and wellbeing, trees improve the quality of life in urban environments where 95% of Californians live. Urban forests are crucial for community resilience and the UCF Program helps create more sustainable urban forests by planting trees, improving regional and local policies, building partnerships, expanding the tree care industry workforce, and supporting education and outreach. The program offers grants for several urban forestry related purposes including urban tree canopy expansion, improved urban forest management, education and workforce development, creating healthier and more natural schoolyards, and urban wood and biomass utilization. There is a very strong emphasis on serving disadvantaged communities, as they are nearly always the communities with the lowest canopy cover and fewest urban forest resources.

Program Impact: With the wildfire resilience funding, the Urban and Community Forestry Program awarded 40 new grants (2021-22-grant-awards_web.pdf (ca.gov)), which will plant more than 37,000 trees, reduce greenhouse gases by nearly 173,000 metric tons annually, and provide workforce development by training, educating, and/or assisting in job placement for more than 1,000 individuals in urban forestry programs. An overview of the Urban and Community Forestry Program grants program is available at, Urban and Community Forestry Grant Programs (ca.gov).

Resilience in Action: The Oakland based non-profit, Planting Justice developed partnerships with the City of Oakland, Alameda County, University of California Davis, and the City of Sacramento for an Urban Forestry Education and Workforce Development grant with total project funding of nearly $3 million (grant funding of $1,453,495; matching $1,458,995). The project is focused on training, education, and job placement for formerly incarcerated and at-risk individuals from black, indigenous and people of color populations to work in urban nursery production. The grant allows Planting Justice to hire and train 15 additional staff for established programs and expand its service area from Alameda County to include a satellite facility in the Sacramento region. This project builds on the $28 million Transformative

Climate Communities grant in east Oakland which produced a multitude of community benefits as documented in the "Going Deep" video presented at the Catalyst Conference February 2023.

Keta Price presenting "Going Deep" documentary

CAL FIRE Urban Forester plants trees with students during a community event.

Climate Catalyst Fund

Department: IBank

Program Description: Businesses in the forestry sector face real challenges raising capital in the private lending market. Creating lower-interest loans removes a major market barrier and expands critical businesses in this sector from micro-mills to masticators to innovative wood and energy products. The Climate Catalyst Fund was established with early action funds in 2020-21 to help jumpstart private sector equipment using wood and woody material removed from forests for wildfire resilience.

Program Impact: Capital was provided in the fall of 2021, along with a crucial legislative change to enable IBank to receive the funds appropriated in 2020-21 and 2021-22. The program was then formally launched in January 2022 and is actively looking at transactions. IBank's Catalyst Fund team is in advanced lending discussions with six project developers, each one of which is bringing significant private capital to the transaction alongside the state's investment. Because of the presences of these outside investors, each project negotiation exhibits its own complexities – these deals take time,

certainly more so than grant allocations do. In addition to Catalyst Fund activity, IBank is working alongside CAL FIRE to support the agency's financing of projects in the biomass utilization sector and is leveraging its small business loan guarantee program to encourage community-scale lenders to invest in this sector. IBank continues to support market growth by utilizing other state and federal funding mechanisms where individual transactions allow, and by connecting businesses, NGOs, and public entities in this sector to IBANK's broader network of financing resources.

Resilience in Action: With the combination of appropriated funding and legislative authorization for IBank to receive and deploy capital, IBank leadership was able to seek and ultimately receive IBank Board approval to launch the program in January 2022. In 2022, IBank received more than 40 expressions of interest in receiving loans or guarantees from the Climate Catalyst Fund. The IBank staff is currently reviewing expressions of interest, working with entities across the state to support the advancement of projects, and engaging third-party capital partners to further leverage state dollars.

Market Development

Department: Office of Planning and Research

Program Description: Diverting forest residues for productive use can help increase the pace and scale of forest restoration efforts in California, reducing vulnerability to wildfire, supporting rural economic development, and promoting carbon storage. The Wildfire and Forest Resilience Action Plan identifies the development of, and access to, markets for these residues as a key barrier to conducting necessary treatment activities across priority landscapes in the state. The development of such a market for residues has been hampered by the lack of any centralized broker capable of entering into long-term feedstock supply contracts.

To address this challenge, OPR has funded five pilot projects to develop regional strategies to establish reliable access to forest biomass through a variety of feedstock aggregation mechanisms and organizational innovations. The pilots will develop plans to improve feedstock supply chain logistics within each target region through the deployment of a special district with the authority and resources to aggregate biomass and facilitate long-term feedstock contracts. Each pilot will assess market conditions, evaluate infrastructure needs, and work to enhance economic opportunities for biomass businesses in their project regions. The pilots are distributed across 17 counties in the Central Sierra, Lake Tahoe Basin, Northeast California, North Coast and Marin County.

Program Impact: In Fiscal Year 2021-2022, OPR was appropriated $3 million from the Wildfire and Forest Resilience Early Action Package (SB 85), to support the development of five feedstock aggregation pilot projects. In Fiscal Year 2022-2023, OPR was provided an additional appropriation of $2 million under AB 179, to enhance forest sector market development and to facilitate implementation of the pilot projects.

In 2022, OPR awarded $2.5 million to launch the pilots through five grants, each in the amount of $500,000 to Fall River RCD, Marin RCD, County of Humboldt, Placer County Water Agency, and Mariposa County RCD. An additional $350,000 was awarded to the University of California at Davis, Cal Poly Humboldt and Cal Poly San Luis Obispo to produce a digital marketplace, using remote sensing data and artificial intelligence, in an enhanced web application to coordinate biomass aggregation and to

facilitate an online exchange between buyers and sellers of forest biomass within the OPR pilot project regions.

At present, OPR is in the process of updating project scopes and amending each grant agreement to provide additional funding to finance implementation of the pilots and to complete the construction of the web application.

Resilience in Action: Through the deployment of the pilots, OPR is supporting capacity building within local governments to improve landscape resilience to wildfire, increase forest biomass aggregation and enhance market development for wood products. The development of the OPR pilot program has sent a strong demand signal to the market not only in California but across the country and around the world. In response to these strategic planning activities, OPR has received strong interest from the biomass industry ranging from biofuels, bioenergy, biochar, CLT and mass timber producers. In anticipation of the OPR pilots and their project activities, a dozen or more biomass industry members have been actively coordinating with OPR, GO-Biz and I-Bank to evaluate project sites and secure funding for biomass facilities within the five OPR pilot project regions. These businesses have expressed strong interest in investment opportunities that otherwise would not be financially feasible without the feedstock aggregation activities under development within the OPR pilots. Based upon the interest expressed through biomass business inquires at GO-Biz, the project has sent a strong demand signal to the biomass industry that California is ramping up and creating an attractive economic environment to drive sustainable forest management and increase community fire resilience benefits.

Residential Centers (Capital Outlay)

Department: California Conservation Corps

Program Description: To further expand forestry corps and fire crews the CCC is expanding and enhancing the Residential Program. With housing insecurities, lack of affordable housing, homelessness, and other social factors that can impact vulnerable youth, expanding residential program does not only promote Corpsmembers' wellbeing, but also enhances the communities in which they serve. Most residential locations are in rural locations where population numbers couldn't field 4-6 youth crews. Additionally, Corpsmembers experiencing new communities embodies the inclusive nature of the CCC. Residential locations also help with fire or other emergency response time as the Corpsmembers are available and ready throughout the entire day, seven days a week.

Program Impact: Opening of the new residential dorms and kitchen complex at the Placer Center located in Auburn, CA enabled 90 Corpsmembers to return to that community and complete very meaningful fuel reduction work. It has also provided a quicker response time for two Type I fire crews working out of the residential facility as they are there 24 hours a day.

This investment is launching capital development projects for building residential facilities for new fuel and fire crews at the CCC Auberry and Los Piños facilities.

Program Impact: Working closely with DGS plans and specifications for both the Los Piños and Auberry projects are being developed with anticipated completion of Preliminary Plans in June and April 2023, respectively.

Resilience in Action:

1. Placer Center Tour Note the linked video highlights the completed construction and the Corpsmember experience as of Fall 2022.
2. Los Piños Center Tour: The linked video highlights the facility and the project work.

Completed Placer Center dormitory building.

Goal 4 – Innovate and Measure Progress

The State continues to invest in inventory and monitoring programs to understand the status of and trends within forests and other natural lands. Data gathered from these efforts are key inputs into modeling efforts that provide an understanding of the past, present, and future of forests, fire, and climate in California. The programs listed below are aligning the efforts of state, federal and local agencies by providing comprehensive assessments and strategies for improving the health and resilience of the state's forested lands.

Research and Monitoring Program (FRAP)

Department: CAL FIRE

Program Description: CAL FIRE (FRAP) implements a Research and Monitoring program that supports:

- Forest Inventory & Analysis (FIA) Program Intensification – re-measurement of California forests in half the normal time (i.e., moving from a 10yr to a 5yr re-measurement cycle)
- Increased prescribed fire monitoring to better understand effectiveness of expanded use of prescribed fire
- Collaborative research in wildfire and forest health issues
- Forest Health Research grants

Program Impact: A network of thousands of forest measurement plots throughout California represent California's portion of the national Forest Inventory & Analysis program. These plots are typically re-measured every decade for specific ecological indicators, creating a measured dataset that informs the State's understanding of biodiversity, forest growth rates, carbon storage, and climate risks. Given the speed of climate change and stressors, this funding is enabling CAL FIRE to measure these plots every five years, rather than ten, to ensure decisions are being made on the most current ecological realities. Funding established two FIA Coordinator positions that will expand CAL FIRE's capacity to implement FIA Intensification and to report on forest health trends.

- FIA data is a primary dataset informing annual reports to the Board of Forestry, and portions of the California Forest and Rangeland Assessment published every 5-years
- FIA data is a primary dataset informing the Pacific Coast Region Temperate Forest Carbon Stocks and Flux: 2001-2019, a regional forest carbon assessment of British Columbia, California, Oregon, and Washington (currently in draft)

FIA plot sampling measuring diameter at breast height of a redwood in Del Norte County

Prescribed fire monitoring Big Trees State Park

Funding for prescribed fire monitoring supports multiple and complementary university contracts (UC Davis, Chico State, San Jose State). This allows for increased capacity to conduct monitoring across a variety of vegetation types and provides an opportunity to support a broader diversity of students.

Wildfire resilience investments allowed the Forest Health Research Program to fund roughly a third of the competitive grant proposals submitted. The program received research proposals totaling $22 million in the last grant solicitation, including $1.5 million for three new projects on CAL FIRE Demonstration State Forests.

Resilience in Action: Examples of funded and ongoing monitoring and research studies include:

- Sierra Nevada Adaptive Management Experiment, funded by CAL FIRE, with new expanded project site in Jackson Demonstration State Forest starting in 2023
- "An open source platform for tracking carbon uptake and storage across California forests" – Dr. Troy Magney, University of California Davis
- "Forecasting the impacts of climate change, land use change, and management on wildfire risk and downstream impacts in Southern California's montane forests and surrounding shrublands" Dr. Alexandra Syphard, Conservation Biology Institute
- "Understanding the costs and limits of vegetation management for wildfire mitigation in coastal California: a comprehensive ecological and economic study at the Soquel Demonstration State Forest" – Dr. Richard Cobb, Cal Poly San Luis Obispo

- Boggs Mountain Demonstration State Forest Post-Fire Revegetation Study – Dave Sapsis, CAL FIRE (CAL FIRE video on YouTube)
- News coverage on the GigaFire Fuels Mapping Project, jointly funded by CAL FIRE and CARB
- Forest Health Research Program webinar: "Climate change and wildfires in western North American forests: a review of ecological departures and adaptation strategies" Dr. Susan Prichard and Dr. Keala Hagmann, University of Washington

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Remote Sensing

Department: CNRA

Program Description: CNRA is investing in high resolution data and analytical products for public safety and to protect ecosystems. Developing reliable base data such as remote sensing like LiDAR will improve predictive modeling, project planning analytics, and long-term monitoring.

Program Impact: In addition to nearly $8 million dedicated to new LiDAR data collections across California, the remainder of CNRA's Remote Sensing Portfolio (nearly $17 million) will deliver new remote sensing acquisitions, processed data products and analytics for application, including:

- Establishment of the first **remote sensing flux tower network in the California.** This will collect data on water and carbon dynamics necessary to calibrate satellite- based data products and inform forest health, carbon, and management assessments.
- **Production of forest structure and individual tree information using high resolution data** for applications including forest, post-fire, carbon, and biodiversity assessments to inform management interventions and fire and fuels mapping updates.
- Statewide **Vegetation Change Detection System** to remotely detect disturbances in fire-prone areas of California. This will help identify impacts from fire, tree mortality and timber harvest and inform evaluations of forest cover loss and recovery. This will help determine where quick intervention is needed to prevent forest canopy loss and prevent native shrublands from converting to invasive grasses.
- Statewide **Wildfire and Forest Resilience Evaluation System** blending field-based and remotely sensed data including water, biodiversity, forest, and carbon to spatially assess and quantify wildfire and forest ecosystem response to management including fuel reduction and forest health treatments. This will be a critical piece of an effective monitoring system.
- Collect and process on-demand, remotely sensed data and imagery to provide timely public safety information critical for assessing **post-wildfire geologic and hydrologic hazards** on state and federal responsibility areas.
- Establish a wildfire resilience planning tool, called **Planscape,** which will help the wide array of wildfire resilience practitioners have the latest science and modeling at their fingertips as they design fuel breaks and forest health projects.

Resilience in Action:

LiDAR: In partnership with the USGS matching grants, California has already collected nearly 30 million acres of new LiDAR data throughout the Sierra Nevada and northern California. This fills in gaps and ensures that nearly every high fire risk region of the State has current LiDAR which will enable a detailed and updated understanding of the major fire impacts and risks across California's critical fire-prone watersheds.

Planscape: In a public-private partnership with Google.org and the California Natural Resources Agency, the team has developed Planscape, a decision-support tool that makes it easier for planners to design wildfire resilience projects with additional environmental benefits, like biodiversity, carbon storage or even future climate modeling. The program uses State and federal data layers (like LiDAR) and models and developed an interactive user interface so the science interments from the State are easily accessible and usable to planners. Given the wide array of organizations implementing California's $2.7B wildfire resilience program, Planscape will make it easier for State, Federal, Tribal and local foresters and environmental scientists to have consistent science and models at their fingertips when designing their projects. This will enable more precise targeting and program design. The tool is anticipated to be publicly available in late 2023.

Interagency Forest Data Hub

Department: CAL FIRE

Program Description: The Hub will expand data sharing and require annual reporting, including acres treated, in a common data repository. These coordinated information products would be rapidly and reliably made available to land managers and decision-makers. CAL FIRE is entering into a 3-year research grant agreement with the Climate and Wildfire Institute (CWI) to develop a Phase 1 Forest Data Hub. The priority for Phase 1 of the Forest Data Hub is to meet the information needs of the Million Acre Strategy.

Program Impact: The development and sustainment of the Hub will help ensure interagency assets are centrally accessible to all government scientists and land managers, university researchers, NGOs, and other users across the state, to ensure policy makers and land managers are using the most up-to-date data and analytics to inform policy, planning, monitoring, and reporting. Phase 1 of the Forest Data Hub will provide functionality to directly support the Million Acre Strategy and in doing so will address complex issues related to data sharing models, data governance, and security issues.

The key components of the Phase 1 Forest Data Hub include:

- Treatment tracking of fuel reduction and other vegetation management projects across State, Federal, and local entities
- Dashboards that provide for reporting status of metrics/indicators
- Support and access to data sets in the Regional Resource Kits
- Improved access to data analytics, planning applications and data visualization tools (i.e., Planscape, Pyrologix, etc.)

- Access to existing forest resources data sets that support the Million Acre Strategy

The Hub may host new and emerging technologies designed to inform forest management practices at multiple scales tied to the Regional Forest and Fires Capacity Program.

Resilience in Action: The Hub is developing an interagency forest treatment tracking system, which will capture projects funded through the State's wildfire resilience funding as well as federal and state partners. This fulfils one of the key actions of the Forest and Wildfire Resilience Action Plan. The Phase 1 of the Forest Data Hub will provide support for regional planning to expand the pace and scale of fuel reduction projects and related vegetation management projects.

State Demonstration Forests

Department: CAL FIRE

Program Description: The California Department of Forestry and Fire Protection (CAL FIRE) operates nine Demonstration State Forests totaling approximately 72,000 acres. The forests represent the most common forest types in the state.

These living laboratories focus on applied research and testing the best forest management practices for carbon sequestration, forest health and fire resilience. Demonstration forests provide answers to some of the most difficult forest management questions that we currently face under a rapidly changing climate, from stand-density to ecological co-benefits to better understanding forest hydrology.

With the ability to conduct decadal-long studies, the demonstration forests inform updates to the forest practice rules governing the 8 million acres of commercial timberlands in California. The forests also provide research and demonstration opportunities for natural resource management, along with recreation opportunities, fish and wildlife habitat, and watershed protection.

Program Impact: In addition to supporting operating costs, this $10 million investment is critical to help modernizing the mission of the demonstration forests. Activities will include:

- A carbon sequestration study
- Prescribed fire research
- Fuel reduction work to enable prescribed fires
- Upgrades to trails and recreational facilities
- Improved community communication programs
- Resources to support tribal co-management.

Mountain Home: The 2020 and 2021 fire seasons killed an unprecedented number of monarch giant sequoias in California. However, the grove of old-growth Giant Sequoias at Mountain Home were protected from catastrophic loss during the 2020 Castle Fire due to a decade of active management, including timber harvest, fuel reduction, and prescribed burning. Funding supported removal and burning of post-fire woody debris to prepare approximately 400 acres for reforestation. 212,000 seedlings, including 25,000 giant sequoias were planted in 2022. Another 10,000 giant sequoia seedlings

are being grown at the LA Moran Reforestation Center for planting in 2023 to complete post-fire reforestation efforts. Mountain Home Giant Sequoia Grove Post-Castle Fire (2020) statistics:

- 2022 Re-inventoried Giant Sequoia: 4,483
- Mortality: 335 (7.5 percent)

Jackson Demonstration State Forest: Understanding the role forests play in watersheds is crucial, especially during California's ongoing mega drought. The Jackson Demonstration Forest has been conducting one of the most comprehensive forest hydrology studies in the nation with data going back to 1962. CAL FIRE just executed a 100-year Memorandum of Understanding with the US Forest Service Pacific Southwest Research Station to continue the Caspar Creek Watershed Experiment. The third experimental harvest in this study occurred in 2018. Specific plots were harvested at different densities to track the water yield relative to the forest density. The 2018 harvest is starting to yield preliminary results on the influence of forest stand density reduction on watershed function and yield. This is critical to understanding how forests can help protect watershed and mitigate drought conditions.

Advancing Scientific Understanding of Forests, Fire, and Climate Change: The following scientific studies are being undertaken on Demonstration State Forests to contribute to our knowledge of forests as a nature-based solution to climate change and demonstrate resilient forest landscape conditions to private landowners.

- Adaptive Management Experiment for Coastal Redwoods: Led by Dr. Sarah Bisbing, University of Nevada Reno, this study will develop three foundational silvicultural treatments to prepare forests for disturbance events exacerbated by a changing climate. Resilience treatments will facilitate recovery of pre-disturbance forest structure. Resistance treatments will allow for the recovery of ecological functions of a forest though the structure and composition may change. Transition treatments will help forests adapt to a changing climate when the forest cannot recover without active intervention. This replicates an ongoing study in the Sierra Nevada forests.
- Potential Elite Tree Identification: Led by Dr. Stephen Sillett, Cal Poly Humboldt, this study will help us understand traits of individual redwood trees in managed forests with the greatest capacity for carbon sequestration and long-term carbon storage.
- Mitigating Wildfire Hazard in the Redwoods: Led by Dr. Pascal Berrill, Cal Poly Humboldt, this study will evaluate the effectiveness and tradeoffs of six common fuel treatments in coastal redwood forests. This funding will facilitate the pre-treatment of approximately 300 acres with mastication and hand crews prior to the reintroduction of prescribed fire. This will contribute to the knowledge of the safe and effective reintroduction of fire into coast redwood forests.
- Cultural Burning for Tanoak Improvement: This study is being conducted in coordination with a local Native American Tribe in Mendocino County to reduce the incidence of acorn weevils and improve acorn production within a coastal redwood forest.

Prescribed Fire Monitoring and Reporting

Department: California Air Resources Board (CARB)

Program Description: Successfully increasing prescribed fire must be supported with effective planning, smoke monitoring and reporting to assess health and climate impacts, as well as public education and outreach to secure awareness and support. Funding is included for the California Air Resources Board and local air districts for increased monitoring, permitting, and communication related to prescribed fire.

Program Impact: Air districts statewide have achieved documented increases in prescribed burn smoke monitoring, and in public notification and public education. Smoke monitors are cached at five locations across the state for air district use. The California Smoke Spotter mobile app received several upgrades in 2022 to improve the public burn and smoke notification platform, including more frequent refreshing of burn status and wildfire notifications added to existing information on individual prescribed burns. The State's voluntary prescribed fire information reporting system (PFIRS) for smoke management is being upgraded in coordination with data system improvements at CAL FIRE and other agencies.

Resilience in Action: In the three years since inception of the CARB prescribed burn reporting and monitoring program, June 2019 to June 2022, the state's air districts logged 9,449 reported prescribed burns, representing more than 366,000 total acres managed. Burns monitored statewide for air quality impacts totaled 987 over the same period, representing a 60 percent average year-over-year increase in burn monitoring from 2020 to 2022.

Program Website Links:

- California Air Resources Board launches California Smoke Spotter app | California Air Resources Board
- California Air Resources Board releases California Smoke Spotter 2.0 | California Air Resources Board
- Agricultural & Prescribed Burning | California Air Resources Board
- Smoke Management Programs and Burn Decisions – Other Air Districts | California Air Resources Board

Traditional Media Coverage:

- Los Angeles Times, Sept. 2022: Forest Service resumes prescribed fire program, but some fear new rules will delay projects
- Los Angeles Times, Aug. 2022: As forests go up in smoke, so will California's climate plan
- TimeOut Los Angeles, Aug. 2022: This app can forecast how bad wildfire smoke will be near you
- KRCR-TV (Redding), July 2022: North Coast air quality officials urge residents to prepare for wildfire smoke risks
- Yuba Net, May 2021: Beale Fire Department, Wildland Support Module set to conduct prescribed burn

- San Francisco Chronicle, July 2021: The number of controlled burns is rising in Is it enough?
- ABC 10 in Sacramento, Jun 2021: New app tracks smoke in California
- Pew Charitable Trusts, September 2020: California May Need More Fire to Fix its Wildfire Problem
- North Bay Business Journal, August 2020: Lack of grazing, prescribed burns adds fuel to California's wildfires, say experts and stakeholders

California Smoke Spotter 2.0 launch (August 2022):

- CARB releases Smoke Spotter 2.0
- #CASmokeSpotter's personalized alert settings can help you plan for possible smoke exposure
- The best way to protect yourself from smoke is to plan for it.

Since California Smoke Spotter was first launched in May 2021, and with the addition of wildfire smoke information and forecasting in August 2022, nearly 8,000 users have downloaded the app.

Budget Tables

View on AirTable