



Advancing Wildfire Resilience Workforce & Career Development in California

Recommendations to Support and Invest in
Workforce, Career Pathways, and Workplace Culture

November 2025

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Prepared by



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Cover image: Students from Long Beach and Los Angeles Conservation Corps reassemble a saw during a Wildland Fire Chainsaws Training held by the Watershed Research and Training Center.

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About this Document

This document was co-developed by Sierra Business Council (SBC) and the Watershed Research and Training Center (WRTC), in partnership with over 60 experts in wildfire resilience workforce and career development from across California. SBC and WRTC present these recommendations to California's Wildfire and Forest Resilience Task Force to advance the development and implementation of workforce and career development priorities as part of the 2025 update to California's Wildfire and Landscape Resilience Action Plan.

SBC serves the economic, environmental, and social needs of the Sierra Nevada, catalyzing innovative solutions and increasing resilience throughout the region. Headquartered in Truckee, California, with satellite offices in Bishop and staff located throughout the Sierra Nevada region, the organization promotes sustainable regional growth by supporting businesses, solving rural issues, and addressing climate change. SBC contributes statewide policy expertise, longstanding engagement in wildfire resilience strategies, and a strong track record in community planning, sustainable economic development, and workforce advancement.

Sierra Business Council's work on this project was supported by a grant made through the Wildfire Strategies program of Resources Legacy Fund.

WRTC is a non-profit organization located in the heart of Trinity County, California. What started in the early 1990s as a local project to retrain displaced loggers and millworkers is now a vibrant nonprofit organization that serves its local community and leads statewide and national initiatives. WRTC conducts the full gamut of land and watershed management services, leads wood utilization and fire resilience partnerships, and, through partnerships with communities, organizations, and public agencies, stewards the landscape, creates and sustains quality jobs, and connects people to the land and each other.



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Contributors

The perspectives and recommendations shared in this document were informed by the insights, professional expertise, and experiences of over 65 subject-matter experts who participated in its development. Contributors included wildfire resilience employers, trainers, educators, and funders, who work across state and federal agencies, Tribes, tribally-led organizations, special districts, nonprofit organizations, academic institutions, private businesses, and more. We are immensely grateful for their time, commitment, and thoughtful contributions to this document and to wildfire resilience workforce and career development.

Acronyms and Abbreviations

Action Plan: California Wildfire and Landscape Resilience Action Plan

CAL FIRE: California Department of Forestry and Fire Protection

CalHR: California Department of Human Resources

CalOES: California Office of Energy Safety

CDFW: California Department of Fish and Wildlife

CCC: California Conservation Corps

CNRA: California Natural Resources Agency

Conservancies: California state conservancies

DOC: Department of Conservation

LCI: Governor's Office of Land Use and Innovation

RFFCP: Regional Forest and Fire Capacity Program

SBC: Sierra Business Council

State Parks: California Department of Parks and Recreation

Task Force: California Wildfire and Forest Resilience Task Force

USFS: United States Forest Service

WCB: Wildfire Conservation Board

WRTC: The Watershed Research and Training Center

Executive Summary

Achieving the goals of California’s Wildfire and Landscape Resilience Action Plan depends on a unifying factor: people. From planning, mitigation, and prevention to response and recovery, California’s ability to reduce wildfire risk, protect communities, and steward landscapes relies on a skilled, diverse, and supported workforce.

Advancing Wildfire Resilience Workforce & Career Development in California outlines seven priority recommendations to support the people who do the work and the organizations that employ them. Together, these recommendations form a roadmap to build and retain the human capacity necessary to scale up wildfire resilience efforts – while also creating good jobs, strengthening local economies, and promoting wildfire resilience across the state. The recommendations also acknowledge that building a strong and sustainable workforce requires collaboration across sectors, regions, and localities, with attention to both immediate needs and long-term systems change.

At its core, these recommendations recognize that California’s success in building wildfire resilience depends on the sector’s ability to support good jobs. “Good jobs” means jobs that are known and understood, accessible, competitively compensated, sustainable, and physically and psychologically safe. It also means clear, equitable career pathways and healthy workplace cultures. When California invests in both wildfire resilience projects and the people who implement them, the result is a positive feedback loop: increased workforce capacity, improved job quality and retention, and accelerated pace and scale of action.

The seven recommendations below were developed in consultation with over 65 workforce and career development subject-matter experts from across California, including Tribal staff and representatives, employers, educators, trainers, funders, and wildfire resilience practitioners across government, nonprofit, and private sectors. The recommendations were also informed by the literature, historical and present-day events in the wildfire resilience sector, and SBC and WRTC’s collective expertise.

- **Recommendation 1:** Scope and offer human resources development and compliance resources for all wildfire resilience employers to bolster organizational capacity and support employees
- **Recommendation 2:** Improve access to and pathways for state wildfire resilience careers
- **Recommendation 3:** Integrate leadership, mentorship, communication, and team-building training and support systems into wildfire resilience workplaces to build a healthy workplace culture

- **Recommendation 4:** Leverage grant programs to stabilize and invest in workforce and career development
- **Recommendation 5:** Support traditional and non-traditional education, training, recruitment, and advancement efforts that increase exposure and access to the diversity of wildfire resilience jobs and career paths
- **Recommendation 6:** Explore innovative mechanisms to stimulate and stabilize wildfire resilience jobs, employees, and employers, especially for non-profit organizations, businesses, special districts, Tribes, and Tribal entities
- **Recommendation 7:** Consult and collaborate with Tribes, tribally-led organizations, and Tribal practitioners to develop specific investments, policies, and programs

By integrating diverse insights, highlighting critical needs, and embracing the wide range of occupations and career pathways in the sector, these recommendations offer practical, forward-looking guidance for policymakers, Tribal leaders, agency leaders, grantmakers, employers, workforce boards, regional collaboratives, trainers, educators, and community-based organizations working to advance wildfire resilience across California. Ultimately, these recommendations affirm that building a skilled, diverse, and supported workforce is essential to meeting California's wildfire resilience, environmental, economic, and public safety goals.

I. Introduction

Successful implementation of California’s Wildfire and Landscape Resilience Action Plan depends on skilled, diverse, and supported employees working across the wide range of occupations that are integral to wildfire resilience. For a decade or more, subject-matter experts and the literature have indicated that the wildfire resilience sector has both a recruitment and a retention problem. Entry, mid, and advanced-level jobs alike often go unfilled or experience a high rate of turnover, which then begs the question, “Who will do the work at hand?”

The recommendations in this document are premised on the understanding that to achieve California’s wildfire resilience goals, the sector must support good jobs. “Good jobs” means jobs that are known and understood, accessible, competitively compensated, sustainable for employees, and physically and psychologically safe. Good jobs should also provide stepping stones to prosperous careers.

Creating and sustaining good jobs requires investments in the workforce, career pathways, and workplace culture. These investments should go hand-in-hand with investments in wildfire resilience outcomes. When California invests in both wildfire resilience projects and the people who implement them, the result is a positive feedback loop: increased workforce capacity, improved job quality and retention, and accelerated pace and scale of action.

Without investments in both workforce and implementation, we are forced to withdraw capacity that we cannot afford to lose.

This document is intended as a practical tool for policymakers, agency and Tribal leaders, funders, employers, workforce boards, educators, and community-based organizations. It provides a roadmap for aligning workforce development efforts with the state’s wildfire resilience and economic goals. It also acknowledges that building a strong and sustainable workforce requires collaboration across sectors, regions, and localities, with attention to both immediate needs and long-term systems change.

By applying the recommendations in this document, leaders and practitioners can better ensure that California has a workforce willing and able to perform the critical work of advancing wildfire resilience. The recommendations can help:

- **Guide policy and investment decisions** that grow and sustain the wildfire resilience workforce.
- **Support Tribal leadership** and Indigenous workforce development that values cultural knowledge, stewardship practices, and sovereignty.
- **Inform agency initiatives and interagency coordination** to support and scale workforce capacity in priority areas.
- **Enhance employer capacity** to recruit, train, and retain a skilled workforce.
- **Expand and connect training and education pathways** to make it easier to enter the wildfire resilience sector.
- **Invest in youth programs** that offer early exposure, skill-building, and entry points into wildfire resilience careers.
- **Grow and diversify the talent pool** willing and able in the wildfire resilience sector.
- **Improve job quality and workplace culture**, emphasizing safety, sustainability, and long-term opportunity.
- **Support organizational success** through workforce planning, career counseling, mentorship, and leadership development.
- **Strengthen local and regional efforts** to meet place-based needs and align with statewide goals.

Implementing these recommendations will help California develop and sustain the human capacity necessary to implement the Action Plan and other priority wildfire resilience efforts. It can also help advance economic development across the state, via a [stewardship economy](#) — a place-based approach anchored in the need and responsibility to sustainably manage both landscapes and communities — and California’s [working lands and waters](#) sectors, as identified in the state’s [Economic Blueprint](#). Wildfire resilience can and should deliver on its promise as a sector that fulfills the Blueprint’s goal to uplift communities, protect the environment, and support health and prosperity for Californians.

Key Terminology

This document establishes a common vocabulary to encompass the breadth and diversity of relevant activities. The wildfire resilience sector is broad and diverse, and different sectors, regions, and localities across California may use different terms to talk about similar or related work.

Wildfire Resilience

We define wildfire resilience as the ability of a community and/or landscape to prepare for, respond to, and recover from wildfire. Throughout this document, the term “wildfire resilience” is used to encompass all aspects of the collective effort to reduce the risk of, prepare for, and recover from

wildfire. The wildfire resilience workforce encompasses a diverse range of practitioners focused on preventing, preparing for, responding to, and recovering from wildfires. The work may occur on the landscape, in a community, in the built environment, in an office, in multiple locations, and/or elsewhere. See Figure 1 (pg 31) for more information.

Workforce and Career Development

Workforce development typically emphasizes the human resources and skill sets needed to achieve a desired economic or social outcome. The addition of “career development” expands that emphasis to the education, ongoing training, workplace culture, and support systems that foster long-term participation and career opportunities in the sector. Together, workforce and career development encompass building the workforce, cultivating and retaining talent and expertise, and creating desirable, gainful employment for that workforce.

II. Recommendations & Implementation Steps

The seven recommendations in this document focus on making wildfire resilience a sector with jobs and careers that are known and understood, accessible, competitively compensated, sustainable, and safe (both physically and psychologically). California’s wildfire resilience goals cannot be achieved without a strategic, coordinated approach to support the people and organizations that plan, implement, and sustain this work.

The recommendations and implementation steps below were developed through review of existing literature, engagement with over 65 subject-matter experts (referred to as contributors), and reference to state plans and frameworks. They also incorporate and build on previous efforts focused on workforce and career development in the wildfire resilience sector. Together, the seven recommendations reflect the sector’s most urgent needs and greatest opportunities for workforce and career development in the wildfire resilience sector — from expanding access to high-quality jobs and career pathways to strengthening employer capacity and workplace culture, to increasing Tribal leadership, and stabilizing the economic foundations of the field.

Each recommendation is designed to address one or more of the barriers currently limiting workforce and career development in the wildfire resilience sector, as identified by contributors, including:

- The lack of transparent and accessible career pathways that respond to employees’ particular skills, interests, and needs
- Unhealthy workplace cultures that support employees’ mental and physical well-being, including supportive leadership practices and mentorship programs
- The economic challenges of participating in the sector, both as an employee and an employer
- Insufficient and/or unstable investment in workforce and career development

- The need to support Tribes, Tribal entities, and Tribal practitioners in specific, self-determined, tribally-led workforce and career development

The recommendations respond directly to unmet needs, proven models, and ripe opportunities, strengthening the foundation for long-term, scalable solutions. While each recommendation is distinct in focus, they are also interdependent, mutually reinforcing, and intended to support the wide array of employees and employers that collectively “do the work” of advancing California’s wildfire resilience.

Recommendation 1: Scope and offer human resources development and compliance resources for all wildfire resilience employers to bolster organizational capacity and support employees

Background and Rationale

Organizations, employers, and employees across the wildfire resilience sector often face common workforce challenges, including limited human resources (HR) capacity, difficulty attracting and retaining talent in competitive labor markets, and unclear pathways for employee career progression.

An important facet of building and sustaining HR capacity is the more system-focused area of HR development, which is distinct from HR management. HR development emphasizes improving transparency around career pathways, strengthening supervisory capacity, supporting employee well-being and retention, and promoting a healthy workplace culture. By focusing on a systems approach to increasing employee satisfaction, retention, and performance, HR development offers a proactive approach to address these deeper issues.

Existing resources and organizations provide HR capacity support, including private consulting firms, Small Business Development Centers, and programs supported by state entities such as California’s Employment Development Department, Workforce Development Boards, and the California Office of Small Business Advocate. Making high-quality HR development tools available to *all* wildfire resilience employers – particularly smaller or under-resourced organizations – can bolster employers’ organizational capacity by helping attract, recruit, and retain talent. Doing so, in turn, helps make wildfire resilience careers more attractive and sustainable.

Additionally, keeping up on California labor law requirements can be challenging for employers. Employers report needing assistance with proactively ensuring labor law compliance with regard to topics such as prevailing wage, required employee training, employee manuals, and HR management procedures more broadly.

“California has so many layers of rules, all good-intentioned. But resources for employers to comply with the rules and actually meet the spirit of the rules are extremely limited and often put employers at risk of penalties.”

– Contributor

Specific HR resources can support employers to go beyond HR requirements and move toward transformative investments in workplace culture. For example, many employers are not aware of or do not promote low-cost support services, such as crisis support, that can be added to benefit packages. Employers navigate numerous issues, from health and retirement benefits to sexual harassment training to wage and hour rules. They need tools to comply with and leverage requirements to holistically improve the workers' experience in ways that are scalable, low-cost, and impactful.

Implementation Steps

1.1 - Scope how to host, service, and focus HR development resources for use by all wildfire resilience employers.

- Scope the design and function of a system in which qualified technical assistance provider(s) offer resources to bolster employers' HR development organizational capacity, promote employee satisfaction, help attract and recruit talent, and illuminate customizable career pathways. Resources could include coaching, training, tools, and templates on topics such as:
 - Job descriptions and classifications
 - Recruitment and hiring practices
 - Remote, hybrid, and in-office work stations and best practices
 - Onboarding
 - 360 employee reviews and exit surveys/interviews
 - Compensation guides (including job classifications, duties, pay scales, pay scale determinations, timeline, and criteria for raises, etc.)
 - Employee-centered professional development plans
 - Policies for compensated training and tuition reimbursement
 - Advancement practices
 - Supervisory training opportunities
 - Salary benchmarking
 - Other HR development best practices

- Inventory relevant job boards to identify opportunities for increased efficiency and impact

Potential Actors: DOC and the Watershed Research and Training Center

1.2 - Inventory and scope technical assistance needs, opportunities, and resources to support wildfire resilience employers with meeting and going beyond labor law compliance, with an emphasis on providing tools and strategies for supporting individual employees, supervisors, and employers to both prevent violations and promote a healthy workplace culture.

- To keep implementation costs and scope reasonable, this recommendation does not include traditional HR management, such as personnel management, benefits administration, etc.

Potential Actors: To be determined

Recommendation 2: Improve access to and pathways for state wildfire resilience careers

Background and Rationale

There is a significant opportunity to improve entry and advancement into and through state wildfire resilience careers, especially for underrepresented and rural communities. Contributors consistently noted that the state job application process is complex, opaque, and often discouraging for applicants. Some applicants describe the portal as a “black box,” with limited feedback and minimal human interaction.

Many of the current state classifications used for wildfire resilience roles do not always reflect the specific skill sets needed on the job and include requirements that create barriers to entry, retention, and advancement. Similarly, frequently-used supervisory classifications prioritize technical backgrounds with less emphasis on leadership experience, even though contributors consistently noted that teams and agencies thrive when they have trained and skilled leaders.

“The most highly-skilled person isn’t always the best supervisor.”

– Contributor

Strengthening career pathways in state service requires simplifying the application process, aligning job qualifications with specific job needs, and providing meaningful support to prospective applicants. Combined with robust training, this better ensures employees are available to do the work. These efforts directly support the goals outlined in the California Department of Forestry and Fire Protection's (CAL FIRE) [Strategic Plan](#), which aims to expand access to wildfire resilience careers and can serve as a blueprint for other public employers, relevant state control agencies, and federal partners. Ultimately, this action will help build a more diverse, capable, and skilled state workforce to meet California's growing wildfire resilience needs.

Implementation Steps

2.1 - Assess and reduce barriers within the CalCareers job portal and application processes, including:

- Consider synonyms to the term “exam,” such as “demonstration of qualifications,” to avoid deterring applicants, particularly people underserved by traditional education systems, adverse to tests/exams, and/or seeking entry-level positions.
- Offer more frequent opportunities for prospective applicants to take exams or demonstrate qualifications, and/or align exam and application timelines.
- Create user-friendly notification systems, especially for exam windows, job announcements, job application statuses, and hiring timelines.
- Centralize, clarify, and improve accessibility of information about job descriptions, classifications, necessary qualifications, exams, and benefits from job descriptions and application webpages.
- Develop publicly available summaries, FAQs, or similar explaining common mistakes and best practices for state job applications.

Potential Actors: CNRA, CAL FIRE, California State Parks, CDFW, CCC, state conservancies, and other relevant agencies, in partnership with CalHR and relevant unions and bargaining units

2.2 - Expand recruiting practices and career pathways to reach and attract a wider range of qualified candidates.

- Equip recruiters with knowledge on how to navigate the job portal and application process.
- Use social media effectively to attract and recruit younger candidates.
- Utilize recruiters and recruitment tools that resonate with applicants from currently underrepresented demographics' interests, values, and lived experiences.
- Create hiring pathways for formerly incarcerated people.
- Explore mechanisms to compensate target audiences to attend recruitment events.

Potential Actors: CNRA, CAL FIRE, State Parks, CDFW, CCC, Conservancies, Foundation for California Community Colleges, and other relevant agencies, in partnership with CalHR

2.3 - Review and update CalHR job classifications, criteria, and compensation levels to support career pathways and wildfire resilience outcomes, including but not limited to:

- Use of existing classifications for landscape restoration and management work (e.g., fuels reduction, prescribed fire) and the need for sector-specific series (e.g., restoration management)
- Degree or advanced certification requirements within the job series used for wildfire resilience
- Pathways and requirements for advancement in wildfire resilience careers, including more advanced non-supervisory roles and mid-level supervisory roles
- Recognition of credit for prior learning within classification requirements
- Criteria for supervisory roles (e.g., balance of management, leadership, and technical skills for specific positions), to support functional and effective leaders and a healthy workplace culture
- Accessibility of classifications to agencies engaged in relevant work, including the ability to post recruitments in multiple classifications with overlapping job duties and skill sets
- Fair market compensation packages
- Equal compensation for similar work across agencies

Potential Actors: CNRA, CAL FIRE, State Parks, CDFW, CCC, Conservancies, and other relevant agencies, in partnership with CalHR and relevant unions and bargaining units

2.4 - Train and embed career counselors to 1) provide technical assistance to job applicants and 2) help employees identify wildfire resilience career pathways and navigate professional development decisions that support their interests and needs.

Potential Actors: CNRA, CAL FIRE, State Parks, CDFW, CCC, and other relevant agencies, in partnership with CalHR

2.5 - Integrate a required *Introduction to Fire Ecology* curriculum into the CAL FIRE Fire Academy to build a foundational understanding of natural systems and historical factors underlying wildfire dynamics and resilience strategies, and to prime participants for related career pathways.

Potential Actors: CAL FIRE

2.6 - While continuing to prioritize year-round, full-time employment, expand flexibility for Permanent Intermittent employees to ensure availability for seasonal field work such as prescribed burning, including:

- Allowing hours to reset at the start of either the calendar year or the fiscal year, as determined by the hiring department
- Excluding time spent on emergency response from the annual hours cap

Potential Actors: CNRA, CAL FIRE, State Parks, CDFW, and other relevant agencies, in partnership with CalHR

2.7 - Explore opportunities for interagency cross-training to develop expertise, share knowledge, and increase exposure to career pathways.

Potential Actors: CAL FIRE, State Parks, CDFW, CCC

Recommendation 3: Integrate leadership, mentorship, communication, and team-building training and support systems into wildfire resilience workplaces to build a healthy workplace culture

Background and Rationale

Leadership, mentorship, communication, team-building, and other human-factor skills are vital components of career development, employee well-being (including mental health), and effective workplaces. These skills, and their influence on workplace culture, are recognized in the 2024 CAL FIRE Strategic Plan and by other public, private, and nonprofit wildfire resilience employers.

However, according to the literature and contributors, the culture of the wildfire resilience sector can be challenging. Many contributors described the work culture as toxic, marked by experiences of sexism, racism, classism, nepotism, harassment, and hazing. Employees from underrepresented backgrounds, in particular, describe feeling like they cannot be their authentic selves. An unhealthy culture compounds the emotional toll of working in a field that can be high-stakes and traumatic, increases employees' risk of poor mental health outcomes, and lowers retention rates. Despite these challenges, many stay in the sector because they believe in the purpose of their work.

“Either assimilating or leaving the sector are the options.”

– Contributor

Many contributors credited mentors for their own career success, noting that mentorship is an enabling condition for successful onboarding, retention, and advancement. Contributors also noted that mentorship can be hard to come by, especially for people from non-traditional or underrepresented backgrounds, including women, people of color, LGBTQ employees, and parents. On the other side of the equation, providing mentorship often taxes the already-limited capacity of more experienced employees, contributing to overload and burnout. While expanding mentorship options is necessary, embedding mentorship into workplace cultures described as unhealthy also risks reinforcing harmful power dynamics. Efforts to implement mentorship programs must be tied to broader efforts to reimagine human factor skills, including leadership, communication, team cohesion, and fostering belonging for all employees.

“Once you invest in the person [rather than discipline them], you'd be surprised at what they can do.”

– Contributor

Creative approaches to human factor skill development would yield significant benefits. Contributors emphasized the potential value of cross-organizational training and the importance of mentorship opportunities not directly tied to employment (e.g., through professional associations). Such efforts are consistent with existing state policy, particularly [Executive Order N-16-22](#) and CAL FIRE's Strategic Plan. Ultimately, to retain and support purpose-driven professionals, increase the competitiveness of the sector, and expand the wildfire workforce, the sector must shift away from the status quo toward more inclusive, innovative leadership across the board.

Implementation Steps

3.1 - Inventory proven, high-impact, and positively-received human-factor trainings and resources, as well as mentorship systems, and scope opportunities for making them available to all wildfire resilience employers.

Potential Actors: CNRA, CAL FIRE, State Parks, CDFW, CCC, and other relevant agencies, in partnership with CalHR

3.2 - Leveraging trainings identified in 3.1 when possible, develop, implement, monitor, adapt, and, when applicable, fund cross-agency human-factor training for all employees, including:

- Leadership training, including for early-career and/or non-supervisory staff
- Conflict resolution, communicating across differences, and emotional intelligence training
- Mentorship training
- Ongoing supervisory training

Potential Actors: CNRA, CAL FIRE, State Parks, CDFW, CCC, Conservancies, regional entities (e.g., RFFCP grantees), and other wildfire resilience employers

3.3 - Leveraging systems and models identified in 3.2 when possible, develop, implement, and, when applicable, fund formal mentorship and informal mentorship/peer networking, especially:

- New and proven systems to facilitate and formalize mentorship as a job duty, especially for early-career employees and employees from underrepresented and non-traditional backgrounds
- New and proven systems to facilitate and formalize opportunities to provide mentorship as a job duty
- Models to facilitate mentorship across agencies and organizations
- New and proven systems for peer networking for employees, such as paid time to participate in professional associations or networks
- Monitoring and adaptive management of these systems to identify ongoing opportunities for improvement

Potential Actors: CNRA, CAL FIRE, State Parks, CDFW, CCC, Conservancies, regional entities (e.g., RFFCP grantees), and other wildfire resilience employers

3.4 - Develop, implement, monitor, adapt, and, when applicable, fund, support systems specific to employees from underrepresented and nontraditional backgrounds.

Potential Actors: CNRA, CAL FIRE, State Parks, CDFW, CCC, Conservancies, regional entities (e.g., RFFCP grantees), and other wildfire resilience employers

3.5 - Develop, implement, monitor, adapt, and, when applicable, fund support systems specific to formerly incarcerated employees.

Potential Actors: CNRA, CAL FIRE, State Parks, CDFW, CCC, Conservancies, regional entities (e.g., RFFCP grantees), and other wildfire resilience employers

Recommendation 4: Leverage grant programs to stabilize and invest in workforce and career development

Background and Rationale

The state has historically been a national leader in directly funding wildfire resilience workforce development through specific grant programs. However, workforce and career development grants have often been siloed from implementation grants, which do not invest in the people who do the work. This separation comes at the expense of training and skill development, the development of career pathways, high [rehiring and retraining costs, and productivity lapses](#). Similarly, insufficient indirect cost rates, significant match requirements, and short grant periods can increase unfunded costs and constrain employers' ability to make long-term investments in their employees.

The grant application and scope refinement process provides an opportunity for applicants, especially finalists, and grantmakers to address workforce and career development needs and communicate about various aspects of their organizational culture. While many employers are trying to do right by their employees, one contributor noted that aspects of her work are so under-resourced that she typically works 70 hours a week when onboarding new hires. High-impact mentors and leaders were described by others and themselves as "stretched thin." Many employers do not have unrestricted funds to pay for essential employee training, leaving employees to cover the cost, which ends up constraining both attendance and performance.

Concurrent investments in both implementation and implementers – via workforce and career development – allow wildfire resilience and good jobs to scale together.

Grantmaking can, and should, invest in projects that simultaneously advance wildfire resilience and support the workforce. These investments can be collapsed or scaled based on needs; for example, a high-impact field worker orientation could vary from 15- to 30-minute on-site talks to more in-depth classroom days and/or field tours. Without simultaneous investments in both project implementation and the actual implementers themselves, we reduce capacity from wildfire resilience that we cannot afford to lose.

Implementation Steps

4.1 - Allow and incentivize ongoing workforce, career, and human resources development as eligible expenses for wildfire resilience grantees and subcontractors, including:

- Fieldworker orientation, e.g., on their work's connection to public safety, wildfire resilience, water resources, etc.
- General on-the-job training and professional development, including field-crew specific training and field/office cross-training, to expand understanding of lateral/vertical transfer opportunities
- Training and utilization of human-factor skills essential to implementation, including training in leadership, mentorship, communication, and team building (including paid time to attend trainings associated with Action 3.2)
- Dedicated time for onboarding, management, and mentorship
- Purchase necessary equipment, vehicles, and materials, including personal protective equipment
- Stipends for non-employee contributors who cannot access typical compensation methods
- Use of the HR Development resources in Action 1

Potential Actors: CAL FIRE, DOC, LCI, Conservancies, WCB, CalOES, other state wildfire resilience funding agencies, and regional entities (i.e., RFFCP block grant recipients)

4.2 - Incentivize grant finalists to provide information about workforce development-related organizational policies and outcomes to encourage consideration and dialogue around key issues, including:

- Use of job descriptions
- Leadership models and philosophies (including the use of mentoring and counseling-based approaches to address employee performance issues).
- Opportunities for non-supervisory staff to lead/promote teamwork, etc.
- Rates of employee retention
- If and how mentorship, career coaching, etc., are incorporated into the project

Potential Actors: CAL FIRE, DOC, LCI, Conservancies, WCB, CalOES, other state wildfire resilience funding agencies, and regional entities (i.e., RFFCP block grant recipients)

4.3 - Encourage project site visits by grantors to develop a mutual understanding of workforce and career development philosophies, approaches, and outcomes

Potential Actors: CAL FIRE, DOC, LCI, Conservancies, WCB, CalOES, other state wildfire resilience funding agencies, and regional entities (i.e., RFFCP block grant recipients)

4.4 - Increase coordination among grantees and grantmakers to amplify impact and benefits for the sector by:

- Supporting existing and new peer-learning networks for workforce and career development practitioners to share information, learn, and collaborate on grant-funded projects
- Coordinating and aligning relevant state agencies' approach to supporting workforce and career development in the wildfire resilience sector (e.g., CAL FIRE, Labor and Workforce Development Agency, Workforce Investment Boards, CalOES, California Department of Conservation's Regional Forest and Fire Capacity Program, etc.)
- Funding, as appropriate, peer-learning, and coordination opportunities

Potential Actors: CAL FIRE, DOC, LCI, Conservancies, WCB, CalOES, other state wildfire resilience funding agencies, and regional entities (i.e., RFFCP block grant recipients)

4.5 - Fund grants and agreements to existing and new wildfire resilience workforce and career development programs, including:

- Recruitment efforts that support diverse applicants
- Programs explicitly designed for pre-employment, early career professionals, formerly/currently incarcerated people, and continued education/on-the-job training around career pathways and navigating barriers to employment
- Explore and support vocational rotation programs that offer exposure to the breadth of wildfire resilience careers,

- Efforts that promote a healthy workplace culture
- Additional activities and programs described in Action 5

Potential Actors: CAL FIRE, DOC, LCI, Conservancies, WCB, CalOES, other state wildfire resilience funding agencies, and regional entities (i.e., RFFCP block grant recipients)

4.6 - Structure grants to more broadly support workforce and career development in grantee organizations and subcontractors:

- Expand the use of block grants, building off the success of the Regional Forest and Fire Capacity Program, CAL FIRE Wildfire Resilience block grants, Sierra Nevada Conservancy Landscape Investment Pilot Program, etc.
- Continue to shift toward 5- to 10-year grant terms for both competitive and block grants.
- Include workforce and career development objectives, systems, and outcomes in intermediate/progress and final grant reports.
- Continue to support federally negotiated indirect cost-rate agreements (NICRA) or a 20% overhead rate for organizations without a NICRA to cover the actual costs of doing business.
- Cease match requirements for state grants to sustain organizational capacity and improve the distribution of funding.

Potential Actors: CAL FIRE, DOC, LCI, Conservancies, WCB, CalOES, other state wildfire resilience funding agencies, and regional entities (e.g., RFFCP block grant recipients)

4.7 - Fund grants that advance the development, refinement, and establishment of the innovative funding and financing mechanisms detailed in Action 6.

Potential Actors: CAL FIRE, DOC, LCI, Conservancies, WCB, CalOES, other state wildfire resilience funding agencies, and regional entities (e.g., RFFCP block grant recipients)

Recommendation 5: Support traditional and non-traditional education, training, recruitment, and advancement efforts that increase exposure and access to the diversity of wildfire resilience jobs and career paths

Background and Rationale

There is a lack of awareness about employment opportunities and career pathways in the wildfire resilience sector. Contributors frequently noted the need for K-12 curricula, youth programs like 4H or Future Farmers of America, and other non-traditional education programs that build understanding of wildfire science, resilience strategies, and associated career opportunities.

Entry-level employees also have limited exposure to and training for lateral and vertical career opportunities beyond physical labor. One contributor described a situation in which employees who conducted hazardous fuels abatement every day were not aware that they were on a “fuels crew.” Those same employees did not receive any internal orientation or training on fire ecology or the connection of their work to wildfire resilience.

“There seems to be an assumption that those with a high school diploma or less are suited only for learning how to conduct field work...while those with degrees are pointed to more white-collar kinds of work, such as planning. There is no reason why someone with a high school diploma can't become a GIS technician.”

– Contributor

Without understanding how their job fits into the wildfire resilience sector, other potential opportunities, and the steps required to pursue other opportunities, it is difficult for employees to turn that job into a career, and it is less enticing to remain in the sector. The understanding of how to successfully enter the sector is even more strained among those underserved by traditional education systems. Contributors frequently noted that when it comes to career pathways, one size does not fit all. Rather, pathways are individual and should be revisited as employees grow and develop.

“When you're trying to serve underrepresented people, they are not making it out to job fairs.”

– Contributor

Additionally, there are acute needs for entry-, mid-, and advanced-level practitioners to acquire particular skills, knowledge, and certifications. Intensive training that does not require college enrollment and is offered at low or no cost can help meet those needs. The sector also currently lacks systems for the transfer of credentials and certifications across different employers, including federal/state and public/private transfer.

Numerous leaders and organizations are innovating ways to expand awareness and understanding of career pathways, including Tribes and Tribal organizations, CAL FIRE, community colleges, community-based organizations, labor organizations, private industrial landowners, licensed timber operators, and utilities. Continued support for and expansion of these efforts will help employers and employees find one another for entry-, mid-, and advanced-level positions.

Implementation Steps

5.1 - Build out existing and new opportunities to increase exposure and access to the full gamut of wildfire resilience careers (see Figure 1), with a focus on:

- Tribal programs
- K-12 curricula that offer multiple opportunities for students to learn about regionally- and locally-relevant wildfire science, resilience strategies, and individual career pathways
- Library, community organization, conservation corps, other corps, and job training programs, summer camp programs, mentorship programs, and other non-traditional education programs, including those that compensate participants when appropriate
- Fire camps and other efforts specific to currently or formerly incarcerated people
- Associate degree programs
- Pre-apprenticeship programs, apprenticeship programs, entrepreneurship programs, and pre- or active employment mentoring opportunities

Potential Actors: Local, regional, and statewide trainers, educators, certifying agencies, and their funders

5.2 - Support the development of job-ready knowledge and skills, hands-on experience, and start-up gear (e.g., fire boots) through non-traditional education programs, high school, 2- and 4-year college programs, with a focus on:

- Opportunities to acquire training, certifications, and other necessary qualifications, especially for specialized, in-demand, and hard-to-fill roles like forestry technicians, defensible space and home hardening professionals, heavy equipment operators, groundsperson/apprentice/tree climbers (specific to utility line clearance), millwrights, electricians, machinists, mechanics, engineers, and logistics professionals
- Programs to fill specific gaps, such as forestry higher education in southern California
- Opportunities for driver's education, computer/email access and skills, and English language learning

Potential Actors: Local, regional, and statewide trainers, educators, certifying agencies, and their funders

5.3 - Continue efforts to streamline the process for National Wildfire Coordinating Group (NWCG) and National Wildfire Suppression Association (NWSA) training recipients to receive Credit for Prior Learning for relevant certifications.

Potential Actors: Foundation for California Community Colleges, the California Community College Chancellor's Office, California Workforce Development Board, Local Workforce Development Boards, and others

5.4 - Collaborate with both public and private employers to develop more streamlined systems for the transfer of qualifications and certifications.

Potential Actors: Employers and certifying bodies, including the National Wildfire Coordinating Group, California Fire Marshall, and California Board of Forestry

5.5 - Assess and address certification, legal, and regulatory pathways to alleviate the bottlenecks associated with Registered Professional Foresters, including but not limited to:

- Modernizing exam processes
- Awarding credit for all relevant training and experience
- Exploring apprenticeship or associate pathways
- Maintaining affordable licensing fees
- Re-evaluating requirements that RPFs oversee fuels reduction projects
- Evaluating existing efforts for all of the above

Potential Actors: California Board of Forestry and CAL FIRE, in partnership with private sector employers, utilities, and industry associations

5.6 - Consult with training organizations that have expertise in supporting non-English speakers and English Language Learners to increase access and participation in wildfire resilience careers.

Potential Actors: Major public and private employers

Recommendation 6: Explore innovative mechanisms to stimulate and stabilize wildfire resilience jobs, employees, and employers, especially for non-profit organizations, businesses, special districts, Tribes, and Tribal entities

Background and Rationale

Many state programs support workforce and career development in the wildfire resilience sector, including but not limited to CAL FIRE's Business and Workforce Development Program and Tribal Wildfire Resilience Grants, the California Conservation Corps, Local Conservation Corps, Resource Conservation Districts, the California Department of Conservation's Regional Forest and Fire Capacity Program, the Workforce Development Board's High Road Training Partnership, Regional Workforce Development Boards, the Employment Training Panel, and Workforce Accelerator Fund. Despite the success of these programs, the economic challenges of the wildfire resilience sector – including limited revenue opportunities and a reliance on public grant funding – also impact its workforce and career development.

The lack of sustained funding has significant ramifications for the stability of employers, jobs, and employees. Almost all contributors commented on the importance of ensuring that workforce participants can meet their basic needs. In some cases, contributors reported that it is not economically viable for either employers or employees to participate in the wildfire resilience sector. Housing remains unattainable in many places; one contributor noted that employees live in tents or commute for four hours. Some contributors noted that employees can earn more in fast-food jobs.

“We can't have below market pricing and good wages at the same time. As long as this is tolerated, there will continue to be a lack of interest.”

– Contributor

“When the only incentive for contractors is the lowest bid and benchmarks for the work outcome, the employees of the contractor are the ones who pay the price. In exchange, funders should consider the needs of private employers and understand the position they’re often put in with regard to downward pressure on price with no clear way to obtain support for their employees or workforce development.”

– Contributor

To be successful and sustainable, the sector must deliver economic opportunities that enable participants to meet their basic needs, housing, healthcare, and childcare. Doing so requires effective funding and financing models, beyond grants, that can expand employers' resources to offer competitive compensation and year-round employment that respond to the cost of living in California. [California Jobs First](#) provides a roadmap for developing these economic opportunities. Wildfire resilience is integral to multiple strategic sectors in the Economic Blueprint, including Clean Economy, Working Lands & Water, and Tourism & Outdoor Recreation. It also supports efforts in 11 of the state's 13 Jobs First regions and activities in the strengthen, accelerate, bet, and anchor sector categories.

Implementation Steps

6.1 - Identify and adopt “best value” procurement that favors bids that holistically advance “good jobs” with living wages and adequate benefits rather than the lowest bid or cost per acre.

- Specifically, labor standards, workforce and career development efforts, approaches, and track records, as well as competitive compensation packages for employees, should be primary factors in determining what constitutes the best value. For more examples of possible evaluation criteria, see Recommendations 1, 3, and 4.

Potential Actors: Public sector entities, including but not limited to state and local governments

6.2 - Develop tax credits and/or low-interest, low-barrier, and revolving loan programs to finance businesses, infrastructure, and stabilize workforce and career development investments, including:

- Value-added biomass and wood utilization infrastructure, where public financing can de-risk private sector investment
- Small business development
- Small business equipment and vehicle purchases

Potential Actors: To be determined

6.3 - Continue to provide business development support and technical assistance for local and Tribal work crews and other employers actively committed to workforce and career development through avenues such as the High Road Training Partnership and partnerships with Small Business Development Centers

Potential Actors: Regional Workforce Development Boards, CA Workforce Development Board, Labor & Workforce Development Agency, California Jobs First bioeconomy and working lands & water sector leads, APEX accelerators, resource conservation districts, locally chartered banks, California Infrastructure and Economic Development Bank, philanthropic and impact investors, venture capital, and additional entities to be identified

6.4 - Explore opportunities to support affordable and attainable housing for wildfire resilience employees and employers, including

- Provide technical assistance to employers, developers, local governments, and other parties seeking to increase wildfire resilience workforce housing
- Evaluate opportunities to use state lands suitable for development to build wildfire resilience workforce housing
- Identify funding and financing strategies to support workforce housing development

Potential Actors: To be determined

6.5 - Consider innovative means of stimulating and stabilizing workforce and career development investments that are tied to revenue streams, such as voluntary and regulated carbon markets, mitigation and conservation banking systems, climate resilience districts, and payments for ecosystem services.

Potential Actors: To be determined

6.6 - Explore, identify, and fund strategies and tools to transition seasonal jobs to more year-round work, including:

- Pilot mutual aid models between nonprofits, Tribes and Tribal entities, and special districts to create more off-season opportunities for crews, such as advancing the Watershed Research and Training Center and Big Chico Creek Ecological Reserve's proposed equipment and personnel sharing "All Hands, All Lands" mutual aid model for beneficial fire resource sharing, ordering, and qualifications management.
- Expansion of the LCI's Digital Marketplace for Biomass Contractors (part of the Biomass Consolidation Pilot Project) to facilitate the connection of Tribal and local work crews with public project workforce needs

Potential Actors: To be determined

6.7 - Maintain and expand funding, to the extent possible, for childcare, healthcare, food assistance, transportation, and broadband internet to provide support when wages lag behind the cost of living

Potential Actors: To be determined

Recommendation 7: Consult and collaborate with Tribes, tribally-led organizations, and Tribal practitioners to develop specific investments, policies, and programs

Background and Rationale

While the state continues to make strides in reconciling with its long history of Indigenous genocide and land theft, workforce and career development in the wildfire resilience sector has a distinct Indigenous lens that must be acknowledged, respected, and invested in. Indigenous people must be seen and recognized as more than possible laborers: they are historic knowledge keepers, the original stewards of the land, and the leaders of tomorrow. To appropriately support the rights and needs of Tribes, Tribal entities, and Tribal practitioners, the state must better understand perspectives on and pathways for tribally-led wildfire resilience workforce and career development.

Investing in Tribal workforce and career development also presents a unique set of variables and opportunities with regard to funding and financing. For example, the establishment of Tribally-governed endowments, similar to university endowments, could create opportunities for tribes to manage investments from multiple sources, such as direct state or federal appropriations, interest revenues, or utility settlements. Regarding compensation, appropriate methods may range

from stipends to individual practitioners to multi-year grants or subawards to Tribal organizations to funds for Tribal governments to invest in endowments.

Consistent with CNRA's [draft Tribal Stewardship Policy](#), all efforts to implement this action must balance respect for Tribal sovereignty with the obligation to appropriately invest in and compensate this critical component of the workforce.

Implementation Steps

7.1 - Consult and collaborate with Tribes, tribally-led organizations, and Tribal practitioners to develop Tribal-specific investments and other opportunities to support workforce and career development.

Considerations shared by contributors included:

- Investments in long-term, revenue-generating funds for supporting place-based Tribal stewardship and maintenance in perpetuity
- Funding and support for tribally-led peer learning, partnership development, training, and training centers focused on Indigenous knowledge-based fire and land management practices
- Compensation to Tribal leaders, practitioners, and/or Tribal staff for their time, travel, lodging, loss of other income, and/or childcare associated with leading, planning, and/or implementing the full suite of land management activities, including beneficial fire
- Funding and support for Tribal intergenerational learning, including but not limited to K-12 programs
- Funding for Tribal practitioners and crews to obtain training and certifications
- Education for non-Tribal partners on Indigenous culture and lived experience (e.g., work schedule, customs/norms, familial and ceremonial obligations, etc.)
- Development of resource centers on tribal land that offer services including childcare and computer and internet access to support access to and participation in job and burning opportunities
- Funding and support for workforce housing for Tribal staff and Tribal people
- Creation, training, and ongoing support for additional Tribal liaison positions in agencies seeking to do this collaboration and consultation

Potential Actors: CNRA and all other state agencies

III. Development of Recommendations: Key Concepts and Context

The recommendations above are informed by a two-part conceptual framework, as well as the present-day and historical context.

The first key concept answers the question, *Which workforce?* That is, what is the broad range of occupations that comprise the wildfire resilience workforce? The second key concept takes a systems approach to consider the factors that impact an employee's professional experience, including education, training, recruitment, retention, advancement, leadership, and mentorship.

These key concepts, and the recommendations above, are also informed by historical and present-day events that have shaped the nature of the wildfire resilience sector. This context helps explain and inform the needs and opportunities that employees and employers experience today.

Key Concepts: Careers in Wildfire Resilience

The wildfire resilience sector is emergent and rapidly evolving to respond to new and growing needs. The jobs and skill sets involved encompass a wide array of people and areas of expertise. As wildfire challenges evolve, governance changes, and technology advances, the sector will continue to expand to include subsectors and jobs that the sector has yet to imagine. For example, 10 to 15 years ago, fire-adapted community county coordinators and drone operators were not viable or existing career paths in the sector, but are now widely recognized roles.

Figure 1 illustrates current primary career subsectors within the wildfire resilience sector, where sample job titles are seen in "wedges." Employees may move between subsectors throughout their careers; these cross-sectoral transfers are illustrated by the dotted lines separating the wedges. For example, someone may start as a hand crew member (in the wildland fire managers subsector), then work as a botanist (natural resource specialist - non-forestry), and then supervise a team of wildfire resilience practitioners as a program director.

Figure 1: Careers in Wildfire Resilience Wheel



The diverse range of careers that directly contribute to wildfire resilience. Only career areas that substantially focus on wildfire resilience are shown. Numerous other subsectors and professions also play a role in wildfire resilience, such as defensible space and home-hardening professionals, insurance specialists, teachers, etc.

A [more detailed version of the career wheel](#) illustrates a non-exhaustive sampling of the jobs within these subsectors, listed in no particular order. Many of these jobs could be placed in more than one subsector. Here, they are organized according to what most people in those roles typically do on a day-to-day basis. It is critical to note that daily tasks do not always align with a practitioner's background and formal training. Some roles are performed by employees who undertake different tasks at various times of the year. For example, wildland fire managers may work on both fire suppression and beneficial fire management depending on the season.

Now used widely to build understanding about the diversity of wildfire resilience careers, these graphics were originally created as a visual aid to fill a knowledge gap among early-career fuels

practitioners regarding how their work could lead to a long-term career. This need yet again highlights the need for transparent and accessible career pathways.

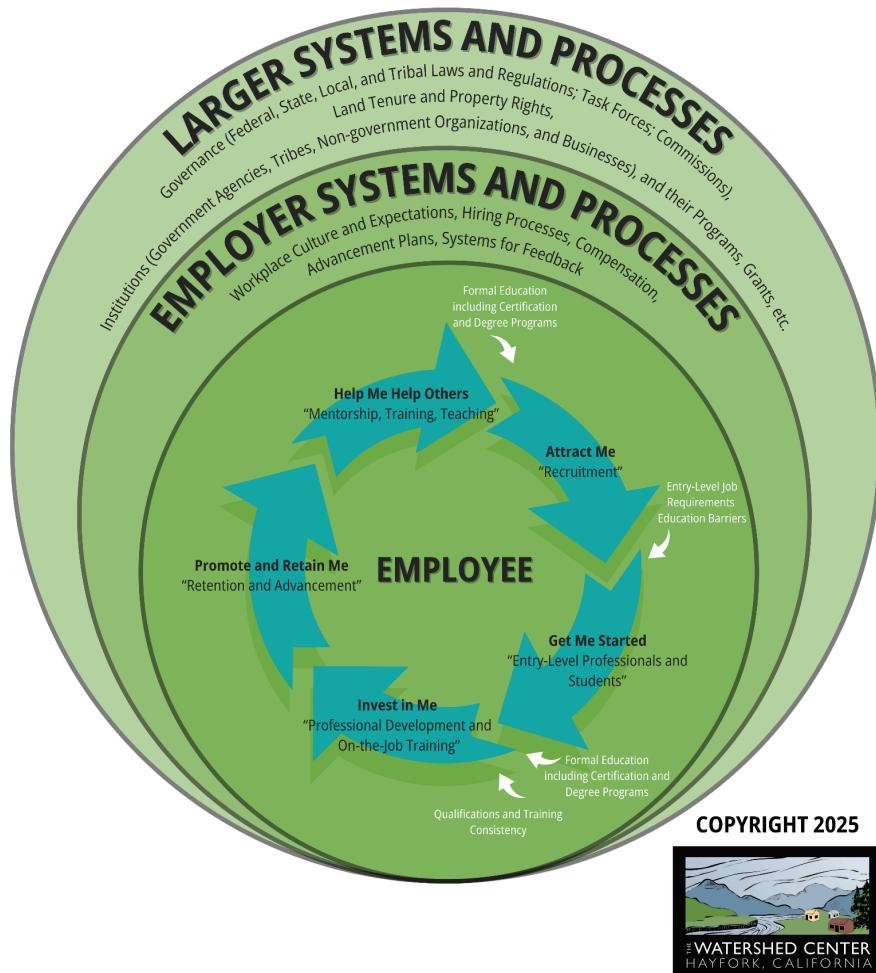
Key Concepts: The Employee Lifecycle

An employee's experience throughout their career is often characterized by what the field of Human Resource Development calls an employee lifecycle. Throughout the lifecycle, employees (who may or may not receive formal education or training before employment) experience different stages of the professional experience, including:

1. Pre-employment education and training
2. Recruitment
3. Onboarding
4. On-the-job training and professional development
5. Retention and advancement
6. Investing in mentors, teachers, and leaders

Several factors influence an individual's ability and interest in working in the wildfire resilience sector. These factors include policies, practices, and laws across private employers and local, state, and federal government agencies. Additionally, micro- and macroeconomic factors contribute to the viability of a career in this sector. The employee lifecycle and its influencing factors are depicted in Figure 2.

Figure 2. Employee Lifecycle Framework



The employee lifecycle frame nests the stages of an employee's professional experience within larger societal and workforce structures and systems.

Present Day Context: California

Workforce and Career Development Accomplishments

Released in 2021, California's first Wildfire and Forest Resilience Action Plan did not include the word "employee." However, in a notable reflection of the fast-changing understanding of the wildfire resilience sector, the Wildfire and Forest Resilience Task Force shortly thereafter established a dedicated Workforce Development Work Group. In 2022, the group drafted a study assessing the current and future workforce needs of California's forest and wood products sectors. That analysis has guided subsequent investments in training and vocational programs and laid a foundation for these recommendations.

The State of California has made historically large investments in wildfire resilience over the past six years, including substantial investments in workforce and career development. A range of state programs and partnerships supported by the state have helped lay the groundwork for these recommendations, including, in no particular order:

- Since 2019, CAL FIRE's Business and Workforce Development Grant Program has awarded approximately \$50 million to educational institutions, nonprofits, start-ups, and existing forestry and forest products businesses.
- CAL FIRE's Tribal Wildfire Resilience Grants
The California Conservation Corps and Local Conservation Corps
- The Department of Conservation's Regional Forest and Fire Capacity Program, which has funded a diverse range of capacity-building efforts, including workforce and career development, since 2019
- California Workforce Development Board's High Road Training Partnership, Local Workforce Development Boards, and Workforce Accelerator Fund
- California Employment Training Panel
- California and Local Conservation Corps initiatives, including but not limited to the partnership between CNRA and California Conservation Corps regarding job placements
- The Wildfire County Coordinators Grant Program, supported by CAL FIRE, has provided targeted investment to develop coordinators who provide connectivity among numerous local and/or county-wide wildfire resilience efforts.

Present Day Context: Federal Government

In recent years, federal policy regarding the wildfire resilience workforce has been changing both gradually and abruptly. In 2023, the Wildland Fire Mitigation and Management Commission released its report [On Fire](#), which included a series of recommendations related to workforce and career development, primarily focused on:

- Improvements to the related federal workforce pay and compensation
- Improvements to career pathways
- Expansion of the types of sectors included and invested in within the sector (particularly concerning stewardship, beneficial fire, and/or community-based roles, and non-federal employees)
- Investment in the mental and physical health of employees
- Increases in training, including how to work with tribes and honor Tribal sovereignty, and
- Housing

In 2025, [wildland firefighters received a permanent pay increase](#), per the recommendation of the Commission report.

Also in 2025, the federal government has moved rapidly to reduce its workforce more broadly, including but not limited to jobs related to wildfire resilience. These actions have included:

- Incentivizing federal employees to resign
- Firing (or attempting to fire) probationary employees
- Directing federal agencies to develop plans for reductions in force (RIF) and reorganization

Some of these actions have been legally contested.

While primary firefighters were exempt from the probationary employee firing, many federal workers who act in fire-related roles as secondary and/or seasonal duties are no longer in their positions. Administrative reductions – for example, of employees who oversee grants and contracts, payroll, etc. – will likely strain the remaining workforce's capacity.

Looking back, the federal government underwent a RIF in the 1990s, which may be connected to some experiences of the present-day workforce, especially leadership shortages.

More broadly than wildfire resilience, several federal labor laws impact the economics of the wildfire resilience workforce. The Davis-Bacon Act sets rules related to prevailing wages for federal spending for construction-related activities, and the Service Contract Practices Act establishes rules related to prevailing wages for non-construction-related federal spending.

Patterns and Trends in the Sector

The bulk of policy and research on workforce and career development specific to wildfire resilience has been focused on three main subsectors: forestry practitioners, fuels practitioners, and wildland fire managers. Nationally and particularly in the West, these three subsectors are known to face many challenges. Forestry and fuels practitioners often experience “unsafe working conditions, inequitable wage practices, violations of worker rights, limited opportunity for advancement, and a lack of recognition and inclusion” ([Multiple Stories, Multiple Marginalities: The Labor-Intensive Forest and Fire Stewardship Workforce in Oregon](#), Davis et al., 2023). The subsector of wildland fire management is fraught with challenges of its own, including pay disparity and a disproportionate burden of mental and physical health issues, ranging from increased rates of cancer ([Wildland Firefighter Smoke Exposure and Risk of Lung Cancer and Cardiovascular Disease Mortality](#), Novarro et al., 2019) to increased risk of suicide ([Wildland Firefighters and Suicide Risk: Examining the Role of Social Disconnectedness](#), Stanley et al., 2018). The federal and state governments' responses to and management of these challenges vary across scales and over time.

There are also several known knowledge gaps in our understanding of the wildfire resilience workforce. Social and economic data related to this workforce have historically been difficult to track and assess because of the widely dispersed, intermittent, and mobile nature of many employees. More recently, as the wildfire resilience sector has grown to include a much broader array of occupations (see Figure 1), there is no defined methodology or system for tracking characteristics of employees or occupations. Knowledge gaps related to workforce participation include:

- The number of full-time equivalent employees actively at work, and income generated, within the various subsectors of the wildfire resilience workforce
- Which wildfire resilience careers typically lead to advancement vs. resignation and/or exiting the sector
- Which subsectors have the biggest workforce shortages, and the primary drivers of those shortages

Continuing to assess these and other known knowledge gaps is a focus of complementary efforts by both SBC and the WRTC.

Compounding Challenges

Several systemic factors compound the existing challenges around workforce and career development in California. Outcomes in the wildfire resilience sector – for both employees and wildfire resilience more broadly – are tied to the ongoing need for funding, housing, and other social infrastructure. While many of the recommendations in this document can be advanced independent of these needs, holistic success depends on building creative solutions to core systemic challenges.

Funding

Implementing the recommendations above requires sustained funding. However, existing models to fund workforce and career development within the wildfire resilience sector — including total investment, reliance on unstable public funding, and the lack of reliable revenue streams — do not meet the need. This challenge is exacerbated by present-day economic uncertainty, budget constraints and deficits, and increasing costs.

The sector's funding challenges were embodied by the public policy debate over California's [AB 338](#) (Aguiar-Curry, 2023). The law, which went into effect on January 1, 2024, requires that prevailing wages be paid to fuels practitioners in certain contexts. This law will likely increase compensation for at least some employees. As the legislature considered this bill, opponents noted that increasing labor expenses would reduce the funding available for implementation of wildfire resilience projects, while proponents noted that scaling implementation depended on the existence of desirable, competitive jobs.

To avoid a zero-sum situation between wildfire resilience outcomes and workforce and career development, additional funding and financing strategies are needed to stabilize and expand workforce capacity and support good jobs.

Housing & Social Infrastructure

The lack of affordable, available, and achievable housing in California is a parallel crisis that directly impacts the wildfire resilience workforce and success across the sector. Across the state, a shortage of housing is one of the most commonly cited barriers to expanding the wildfire resilience workforce and thus achieving California's wildfire resilience goals.

The shortage extends to other critical social infrastructure, including health care (for both physical and mental health), childcare, broadband, and transportation that does not rely on a personal vehicle. While addressing these challenges is beyond the scope of these recommendations, these issues will continue to constrain workforce and career development in the wildfire resilience sector and, in all likelihood, across the state's economy.

Lastly, it is worth noting that sectors that provide competitive wages, including in some cases prevailing wages, do not experience the same demand for employee "wrap-around services."

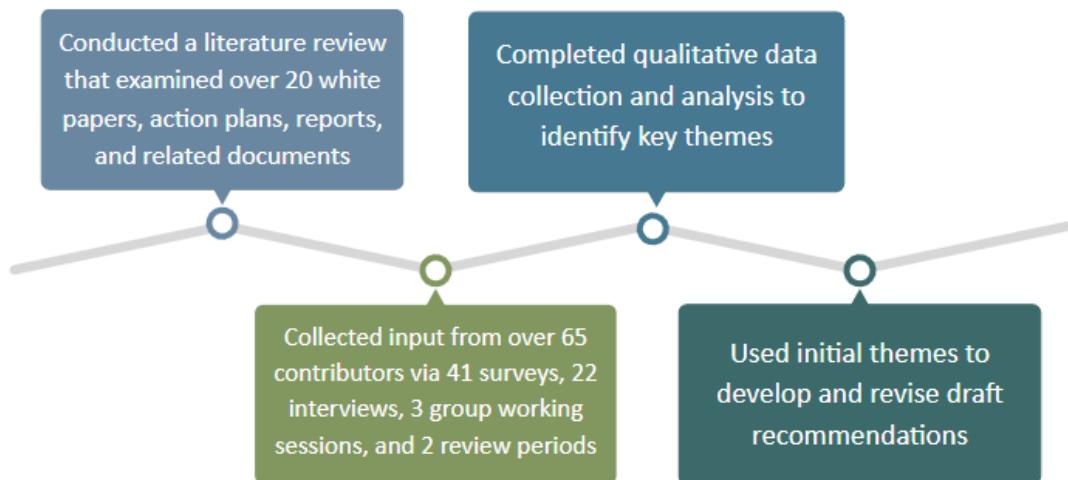
The challenge of securing housing, health insurance, childcare, and transportation can be addressed in one of two ways: addressing the strains and shortages on social services and infrastructure, or increasing employee compensation and investment in the sector.

Increased investment in the wildfire resilience workforce depends on increased recognition of the core public service and backbone natural infrastructure provided by the sector as a whole.

IV. Strategy Development: Process Overview

Figure 3 outlines the process used to develop this Strategy.

Figure 3. Strategy development process overview



Step 1: Literature Review

SBC and WRTC conducted a literature review of existing literature on workforce and career development in the wildfire and forest resilience sector. The review examined over 20 white papers, action plans, reports, and related documents, with a focus on recommendations related to the wildfire workforce across various subsectors, stages of the employee lifecycle, and levels of government. Major themes from the literature review included the need for:

- Clearer pathways to enter the workforce, including more youth engagement and better overall visibility of the workforce
- More training opportunities
- Investment in the culture, safety, and viability of the workforce, including mental and physical health, working conditions, housing, etc.
- More diverse and inclusive opportunities and spaces in the workforce.

See Appendix B for a summary of the literature review.

Step 2: Input from Subject-Matter Experts

Over 65 subject-matter experts (SMEs) from across the state contributed to the development of the recommendations in this document. Contributors were identified based on their subject-matter expertise with wildfire resilience workforce and career development, including specific expertise with a given subsector, employer type, geography, or role in workforce and career development. Input collected included:

- 41 surveys
- 22 interviews
- Numerous additional personal conversations
- 3 working group sessions
- 2 windows for document review and written feedback

Qualitative Data Collection and Analysis

In early 2025, a questionnaire was sent to over 75 SMEs in California to collect information on 1) what is and is not working well with workforce and career development, and 2) recommendations to address needs and gaps. The questionnaire used the employee lifecycle framework to center employees' experience (see Figure 2). SMEs had the option to answer the questionnaire via survey or interview; the same questions were used in both formats. See Appendix C for questionnaire results.

Preliminary data analysis identified several preliminary themes:

- The need for transparent and accessible career pathways that respond to employees' particular skills, interests, and needs
- The importance of healthy workplace cultures that support employees' mental and physical wellbeing, including supportive leadership practices and mentorship programs
- The economic challenges of participating in the sector, both as an employee and an employer
- Insufficient and/or unstable investment in workforce and career development
- The importance of supporting Tribes, Tribal entities, and Tribal practitioners in specific, self-determined, tribally-led workforce and career development

Contributors reviewed and discussed these preliminary themes at the first working session. Questionnaire data were then qualitatively coded, using preliminary themes as the initial nodes and building a codebook based on patterns identified through iterative review of the data.

Development and Revision of Recommendations

Following coding, data were cross-referenced with recommendations from the literature and SBC's and WRTC's expertise to draft recommendations and implementation steps. Draft recommendations

were iteratively refined, with input from contributors during two working sessions and two review periods.

Appendices

Appendix A: Workforce Recommendations Alignment Table

Implementing the recommendations in this document will help California develop and sustain the human capital vital to achieving the goals in the Action Plan. As such, these recommendations can also help create the enabling conditions for other workforce-specific actions, including those tied to beneficial fire, reforestation, state lands, ignition prevention, and other subsectors where the career pathways are both emergent and essential to state goals. This table cross-references the recommendations in this document with the recommendations from topical Working Groups convened by the Task Force.

Access the table [online](#).

Appendix B: Literature Review Summary

Source	Author	Publication Date	Recommendations
<u>Apprentice Professional Forester Educational Program Proposal, 2024</u>	California Board of Forestry and Fire Protection	2024	Create a pathway for an additional RPF examination - purpose is to create an alternative licensing pathway titled the Apprentice Professional Forester (APF) educational program. Any public agency or professional society could submit to the Board their proposal to educate forestry licensing applicants and provide requirements for evaluation and/or testing of core competency subject matter in forestry. After completing the APF, mentored forester graduates would only need to pass an abbreviated exam. Through this alternative option, there would be an increase in the rate of RPF licensing exam success.

Source	Author	Publication Date	Recommendations
<u>Building a Robust and Representative Wildland Fire Mitigation and Management Workforce</u>	Stanford Climate & Energy Policy Program	2024	<p>1. <u>Invest in inclusive opportunities for career development.</u> a) Developing onboarding resources to help create high-performing, safe, and inclusive work environments while encouraging lifelong careers in fire to address barriers to career development and longevity. More specific recommendations for this include developing mentorship programs with senior employees, modifying mandatory coursework to include more information on bias and discrimination, and expanding the Wildland Firefighter Apprenticeship Program to include not just fire response but also wildfire mitigation, preparedness, and post-fire recovery b) Develop sustainable funding mechanisms to support partner organizations engaged in building a stewardship-oriented fire management workforce. This should include expanded access and funding for specialized training opportunities, and creating training specifically for underserved populations entering the workforce. c) Create new types of fire training modules that reflect the highly-skilled and varied expertise necessitated by modern wildfire management. d) Provide expanded coverage for affordable child care to make careers in fire more supportive of caregivers, parents, and families. This could be done through back-up child care coverage that would reimburse the cost of emergency child care coverage when firefighters have to leave for assignments on short notice, and provide food assistance and preferred enrollment access for child care, schools, and after-school programs.</p> <p>2. <u>Address health inequities.</u> a) Include female reproductive organ cancers in presumptive coverage legislation, as is the case for male reproductive organ cancers. Firefighters are at an increased risk of cancer, but currently, OWCP does not include cancers most often occurring in females in coverage. b) Provide expanded mental health services specific to wildland firefighters and their families, including trauma-informed and gender- and culturally-responsive care. Specifically, Congress should direct agencies to explicitly include gender/culturally responsive care within their mental health and well-being program mandates. Agencies should also form identity-specific peer support groups (potentially modeled off of the National Interagency Wildland Fire and Aviation Critical Incident Stress Management Program) and create additional agency positions to coordinate, develop, and provide culturally/gender responsive care. Finally, the duration and availability of access to mental health resources should be increased for everyone involved in fire management and mitigation. c) Provide wildland firefighters with subsidized options for health coverage for expanded services related to reproductive health and family planning so firefighters do not have to choose between a career in fire and a family. d) Fund studies to better understand the physical and mental health outcomes of underrepresented groups in fire. Research should focus on tracking injury/illness/exposure firefighters face during their career, physical stress, impacts of occupational exposure on reproductive health, and physical/mental health across different areas of fire mitigation and</p>

Source	Author	Publication Date	Recommendations
			<p>management.</p> <p>3. <u>Strengthen Workplace Culture</u>. a) Mandate workplace culture assessments and culturally-relevant training opportunities with quantitative and qualitative data collection. b) Engage consultants to build agency capacity for organizational learning and change. This can address the problem of internal organization accountability and commitment to equity.</p>
<u>Building California's Forest Resilience Workforce</u>	The Nature Conservancy	2023	<p>1. Invest in workforce housing. This may be the greatest barrier to growing CA's forest restoration workforce, especially for entry-level employees and those in the missing middle. On-site housing could be a good option to consider, as it allows for a rent cap and could be done on already available Forest Service land. Another potential policy solution would be a housing allowance for employees to keep housing costs below 30% of their income, although in the long run, this would be less cost-effective.</p> <p>2. Ensure federal-state pay parity. CAL FIRE pays significantly more than USFS. There is concern that USFS employees and new entrants to the workforce would move to CAL FIRE and other higher-paying employers, preventing USFS from accomplishing its goal to treat 500,000 acres in CA annually. With higher housing costs in CA, it is essential to ensure pay parity to reduce high rates of USFS attrition.</p> <p>3. Improve firefighter working conditions and mental health care. With growing hours and days worked in a row and increases in calls to the mental health crisis hotline, there is a need for more funding for mental health resources and a change to working conditions for firefighters.</p> <p>4. Improving Entrance into the Profession. Currently, retirement is outpacing new licenses by more than 2 to 1 among Registered Professional Foresters. To stop the diminishing size of this workforce, policies could allow degrees and certificates from accredited forestry programs in college to count towards the professional forester license requirement, provide more awareness of the forestry professions in high school, and coordinate more with employers to develop career awareness. Remove barriers for qualified firefighters who were previously incarcerated to enter the workforce and increase training capacity.</p> <p>Specific State Policy/Funding. a) \$100 million in pilot funding for the development of forest restoration workforce housing on public agency-owned land b) \$10 million to pilot a housing allowance for CAL FIRE employees c) \$5 million to conduct a mental health needs assessment and implement near-term solutions.</p> <p>Specific Federal Policy/Funding. a) Increase the pay of CA-based USFS employees to equal, at minimum, CAL-FIRE counterparts, b) \$10 million to pilot a housing allowance for CA-based USFS employees, c) Reauthorize USFS's authority to build housing on its admin sites in the 2023 Farm Bill, d) Evaluate the impact of mental health investments</p>

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<u>CAL FIRE Strategic Plan 2024</u>	CAL FIRE	2024	<ol style="list-style-type: none"> 1. Attract, hire, and retain quality employees. This should include 1) a career-related website that provides comprehensive resources, an electronic application process to improve access to CAL FIRE's career opportunities; 2) Review and modify job class specification requirements to improve inclusivity and ensure qualified applicants are being reached; 3) Develop an employee feedback portal; 4) Develop resources that promote work-life balance, mental well-being, etc. to enhance job satisfaction and retention; 5) Develop a marketing strategy to recruit a diverse workforce 6) Develop a formalized mentorship program 2. Ensure all employees understand how the Department's various programs and job duties contribute to efficiently achieving the CAL FIRE mission. 1) Develop visual training tools on departmental programs/functions and organizational structures so employees can better understand interactions between regions/units/programs; 2) Develop cross-training opportunities to help employees explore programs in their Department; 3) Develop a real-time tool that allows employees to see the organizational structure with job functions 3. Promote a culture that values equitable access, embraces diverse backgrounds and experiences, and actively removes barriers to cultivate a more inclusive environment. 1) Develop a tool to promote education on DEI and dispel misconceptions; 2) Develop a GIS map that has demographic census data to improve outreach and engagement of underserved communities and tribes; 3) Develop customized plans to better understand organizational and community needs surrounding DEI; 4) Expand the Tribal Affairs Program and Government-to-Government consultations 4. Leverage technology to modernize internal human resources processes and create efficient and effective innovative solutions to promote, support, and enhance the employee experience. 1) Develop ongoing customer service surveys to get feedback on interactions and experiences with HR and processes to improve customer satisfaction; 2) Develop a process to get input from internal HR personnel about barriers and inefficiencies they encounter; 3) Develop an HR focused onboarding process to assist with new-hire paperwork, access to resources/training, and a contact to answer questions; 4) Develop an HR review system for determining compliance in employee applying employee benefits and compensation; 5) Develop detailed HR related trainings to improve internal operational efficiencies; 6) Expand the Supervisor's Toolbox; 7) Develop an HR software solution to streamline communication through an automated submittal and inquiry system 5. Strengthen the Department's physical and digital infrastructure and streamline

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			<p>equitable access to information across core services.</p> <p>6. Identify core capabilities and strengthen operational capacity</p>
<u>California's Strategic Plan for Expanding the Use of Beneficial Fire</u>	State of California	2022	<ol style="list-style-type: none"> Establish Prescribed Fire Training Centers in California, modeled after the successful National Interagency Prescribed Fire Training Center in Tallahassee. Develop Sufficient Prescribed Fire Crews focusing on people with career goals in fire and natural resource management. Retention efforts will focus on pay disparities between roles and housing issues. Create Incentives for Agency Staff, develop targets and performance measures. Increase cooperative efforts on specific burns using a tiered agreement statewide. Also develop programmatic tools for resource sharing and ordering on prescribed fire projects. Increase Diversity by focusing recruitment, training, retention, and contracting strategies on ensuring the prescribed fire workforce reflects the diversity of CA. Currently, there is a lack of women, people of color, and other minorities represented in the fire workforce and in positions of leadership. Increase and improve training, both the quantity and quality available to fire personnel, to meet increasing demand
<u>California's Wildfire & Forest Resilience Action Plan</u>	State of California	2021	<ul style="list-style-type: none"> Establish Metrics: The OPR framework will also include a comprehensive set of metrics to evaluate biomass availability, usage, investments, and workforce levels. Develop Statewide Forest and Wood Products Workforce Assessment: OPR, in coordination with the Labor and Workforce Development Agency and other key agencies and stakeholders, including CAL FIRE, the Community College System, and the Sierra Business Council, will lead the development of a statewide Forest and Wood Products Workforce Assessment by December 2021.
<u>Confronting the Wildfire Crisis: A Strategy for Protecting Communities and Improving Resilience in America's Forests</u>	USDA, Forest Service	2022	<ol style="list-style-type: none"> Build workforce capacity in the Forest Service and with partners to accomplish the work at the scale needed, and establish the large multijurisdictional coalition needed to support the work. Make investments in the workforce to establish new firefighter job series, increase firefighter salary base pay, and convert more than 1000 seasonal firefighters to permanent positions. The workforce needs to focus on fire-adapted forests - a large multiorganizational workforce with expertise in proactive fuels and forest health management to work on forest thinning, prescribed fires, unplanned ignitions, etc. A special workforce to monitor prescribed fires and put them out if they cross certain

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			<p>boundaries.</p> <p>5. Generally, a need to build workforce capacity in Federal and State agencies, as well as in local, Tribal, nongovernmental, and other organizations to coordinate and accomplish work.</p>
<u>Forest Sector Workforce Study Report</u>	North State Planning and Development Collective	2021	<ol style="list-style-type: none"> 1. The forest sector needs to promote itself as a sustainable and ecologically sound industry, which can be done using data on how the industry is environmentally friendly. This will improve negative perceptions of the industry, which are leading to the workforce shortage. 2. Focus on expanding diversity within the workforce - this will bring new skillsets, encourage growth, and create more avenues for employment. 3. Fully address the inherent dangers in the workforce through updating industry safety practices and technology. Firms can support a safety culture and make behavioral changes, develop risk assessment procedures, and increase monitoring to make sure safety practices are being followed. 4. Follow guidance in the "Health and Safety at Work Strategy for the Nation's forest sector" to reduce high injury rates. Recommendations in this report include cooperation between businesses within the sector to help those most in need of improved safety measures, integration of health/safety at all levels, increasing worker engagement/representation in safety procedures and development, increased attention to worker's physical and mental health, more trainings to improve capability in the workforce, and sharing of data/insights surrounding health and safety.

Source	Author	Publication Date	Recommendations
<u>Investment Opportunities for Increasing Forest and Fire Management Capacity in California</u>	The Watershed Center	2020	<p><u>Recommendations to build capacity for the following:</u></p> <ol style="list-style-type: none"> 1. Data monitoring. Since this field often requires scientific/technical expertise and is also cost-intensive, the report recommends hosting a statewide webinar on the basics of monitoring data and using this event to gather additional data on the potential to add capacity in-house vs. contractors. Consider how academia/resource sharing could be used. 2. GIS. Capacity building could include learning from entities that already have GIS capacity and see if they are willing to extend GIS services, exploring current collaborative GIS processes, and finding existing programs to connect GIS training with entities that need this service. 3. Outreach. State-level service providers could discuss a shared vision for outreach in regional and local areas. Resource sharing can also be utilized through a webinar introducing resources, building examples of communication materials, and gathering a group of communication experts to assist entities with outreach. 4. Planning. Develop guidelines or roadmaps for how to conduct planning processes, compile publicly available databases/examples of what others have done, and focus on designing fuel treatments, as this was the top desired planning capacity. 5. Implementation. Expand investment in formal training for implementing and managing defensible space, as well as services related to prescribed fire safety, and coordination of a peer group to connect local workforces and help entities with less established workforces. Entities with limited capacity could also pool resources to achieve training and certifications. 6. Organizational Capacities. Create a database of funding sources, provide grant writing workshops, and enable organizations to collect their full administrative costs (something similar to the federal Negotiated Indirect Cost Rate). 7. Cultural Fire Capacities. Explore ways to learn more about tribes' interests and needs for forest/fire management, other than surveys, share models/examples of partnerships between Tribal and non-tribal entities in forest management, and focus on respect. <p><u>Recommendations on the state level:</u></p> <ol style="list-style-type: none"> 1. More regional or statewide capacity-building programs. Similar to the Sierra Nevada Conservancy's Watershed Improvement Program 2. Expand investment in the Watershed Coordinators grant program. 3. Expand flexibility in existing grant programs. This will allow for more funding for participation in trainings, coordination, partnerships, etc.

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			<ol style="list-style-type: none"> 4. Focusing some funding on non-competitive block grants. To help local groups with baseline operational capacities and planning roles 5. Fulling fund administrative/indirect costs in grants programs. To ensure entities can grow and sustain administrative systems
<u>Local Capacity for Integrated Forest and Wildfire Management</u>	Heidi Huber Stearns, Cassandra Moseley, Nick Goulette	2016	<ol style="list-style-type: none"> 1. Strategies for workforce development can be both broadly replicable and context-specific. Organizations cannot take only one approach to local workforce development and instead need a long-term, multi-pronged approach. 2. Wildfire suppression is double-edged - both an opportunity and a barrier. It provides valued organizational/individual income, yet wildfires are often unpredictable and therefore work can be impossible to depend on year to year. It can be difficult to maintain steady and reliable work, and it can also make it difficult for crews to complete non-fire projects on time. 3. Staff retention is a common challenge as there are often unpredictable workloads and a lack of job security. Capacity for maintaining stable employment can vary by region, timing, fire seasons, etc. 4. Diversity of funding is key. It can be necessary to leverage funds, find sufficient cost-share, supplement existing work, and combat limitations of one funding source. 5. Local buy-in, investment, and support are all important for maintaining long-term funding. External funding is useful, but it is not always permanent. During lean years, having a local base of funding/support is crucial. 6. Year-round/year-to-year support for workers in at-risk forested communities is key to further building response and capacity. To successfully develop consistent and strong local capacity, organizations need long-term, multi-year projects for their crews.

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<u>ON FIRE: The Report of the Wildland Fire Mitigation and Management Commission</u>	50-member Commission	2023	<p><u>Recruiting and retaining the workforce</u></p> <ol style="list-style-type: none"> 1. Increase wages and benefits for the federal wildland fire workforce. 2. Create efficient hiring pathways that support the development of a larger, more diverse, and inclusive workforce. 3. Address "break in service" rules and retirement benefit portability 4. Authorize the Secretary of the Interior to develop a Wildland Fire Management Casualty Assistance Program to provide assistance to next-of-kin of critically injured, ill, or deceased firefighters or support personnel injured or killed in the line of duty; to include emergency family member travel, benefits counseling, and casualty assistance and notification training. 5. Congress should provide funding and authorization for expanded recruitment strategies. <p><u>Expanding the Workforce</u></p> <ol style="list-style-type: none"> 1. Invest in the creation of a workforce primarily focused on restoration and mitigation. 2. Improve the contracts, grants, and agreements process and expand investments in the non-federal workforce. 3. Federal agencies should build on the successful model of Rangeland Fire Protection Associations and provide more federal surplus equipment to RFPAs and other volunteer fire response entities. 4. Tribes should be supported to expand mitigation, response, and restoration workforces. 5. Congress should support the implementation of a Reservist Program to increase both planning and implementation capacity for increasing the pace and scale of planning for and applying wildland fire. 6. Authorize emergency medical care providers to operate on all-hazard responses, including wildland fires. <p><u>Training</u></p> <ol style="list-style-type: none"> 1. Create and fund more training opportunities for the mitigation and management workforce - including community risk reduction and mitigation training, prescribed fire training. 2. Ensure that fire mitigation and management personnel are trained in and respectful of Tribal sovereignty and cultural practices. <p><u>Protecting Health and Well-being</u></p> <ol style="list-style-type: none"> 1. Invest in a comprehensive approach that addresses mental and physical health. 2. Invest in existing and new research and development to improve and mitigate

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			<p>adverse physical, mental, psychological, and emotional impacts to firefighter health and safety when operating in both the built and natural environment.</p> <ol style="list-style-type: none"> 3. Evaluate and expand the definition of "firefighter" as it applies to presumptive coverage. 4. Invest in the completion of a human health risk assessment for worker exposure to wildland fire smoke and smoke from wildfires in the built environment to estimate the nature and probability of adverse health effects in humans who may be exposed to hazards from smoke, with the intent of creating best management practices to mitigate the extent and duration of exposure. 5. Expand and improve the Office of Workers' Compensation Programs processes <p><u>Housing the Workforce</u></p> <ol style="list-style-type: none"> 1. Authorize and fund the provision of housing or a housing stipend for wildland fire mitigation and management personnel. 2. Enable the federal government to transfer appropriate lands and facilities to Tribes for the development of workforce housing.

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Report on the Special Convening for Stewardship Workforce Development: Breaking Silos and Taking Action	The California Biodiversity Network	2024	<ol style="list-style-type: none"> 1. Build an integrated system of stewardship training across the state through policy, collaboration, and funding approaches. Priority strategies to do this include 1) Exploring private funds to support regional training entities, 2) Assess needed skills and define certifications aligned with employer needs, 3) Develop a regional structure for coordinated training and project demonstrations, and 4) Establish shared definitions of skills, codes, and certifications. 2. Promote the recruitment and hiring of qualified workers trained in environmental stewardship and knowledgeable about Traditional Ecological Knowledge to improve stewardship across the state. Priority strategies include 1) Create federal and state occupational codes that accurately represent stewardship sector organizations and stewardship jobs so they can be counted and economic output of stewardship activities can be consolidated; 2) Advocate and lobby for the stewardship sector through coordinated, consolidated, and ramped up lobbying efforts; 3) Advocate for stewardship to be recognized as a formal sector or industry with policy support; 4) Revise procurement and bid process to incentivize contractors to hire trained workers with high levels of environmental literacy. 3. Advance policies that favor nature-based solutions implemented by a trained stewardship workforce. Priority strategies include 1) Create a shared definition of "skilled" and "trained" workforce, aligned to clearly defined job codes that are standardized across the state; 2) Advance economic development through nature-based solutions and promoting environmental literacy of workers and contractors. 4. Improve equitable access to training and employment opportunities for underrepresented and historically excluded communities. Priority strategies include 1) Work with employers to create welcoming workplaces through shared values and expectations, establishing transparent pay scales, mentorship pathways, and training; 2) Build partnerships and collaborations to "meet people where they are"; 3) Support non-traditional pathways and upward mobility through reducing barriers to entry and establishing creative pathways; 4) Reduce barriers to application including supporting people in navigating the interview process, making gov applications simpler, removing unnecessary exams, and providing application support; 5) Promote mentorship to help people grow within stewardship careers. Create pathways that pre-qualify applicants for certain positions. 5. Act in solidarity with Tribal leadership to promote the ability of Indigenous peoples to exercise their rights to steward the land. Priority strategies include 1) Identify

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			opportunities for shared resources and partnerships; 2) Develop and expand programs designed by Tribes and models such as the Indigenous Land Use Agreements and Tribal Stewardship Corps, moving away from colonial land ownership models; 3) Recognize and value experiential, intergenerational knowledge, which may not fit within standard certification models, and support practices that rebuild this knowledge base
Stewardship Workforce Development Training Programs Across California	CBN Stewardship Roundtable	2023	<p>Opportunities and Emerging Models:</p> <ul style="list-style-type: none"> • Building in inclusive practices: providing opportunities for individuals across the spectrum of stewardship and ecological restoration projects • Support for DEI • Shared power and leadership with Tribes: recognition of the immense value of cultural and traditional knowledge held by indigenous peoples. Need for improved outreach, education, and collaboration efforts that bridge the gap between workforce development agencies and organizations providing specialized land and water stewardship opportunities. • Creatively Addressing Barriers: importance of teaching soft skills, addressing barriers, and providing support for program participants. • Measuring success through outcomes and job placements: shift from an emphasis on the number of participants in the program to the number of participants who secure a job after completion of the program. • Importance of partnerships and relationships: actively work to connect with employers such as natural resource agencies, restoration contractors, and other entities to provide a direct pipeline of skilled workers into good-paying jobs

<p><u>University Forestry Programs Summit: Workforce and Training Research Report</u></p>	<p>California Forestry Association/Potrero Group</p>	<p>2022</p>	<p>Workforce</p> <ol style="list-style-type: none"> 1. Recent graduates need more communication, project management, and technical skills. 2. Updated and expanded forestry curriculum to meet the needs of complex problems in the field - especially related to climate change. 3. To address the retirement of many licensed RPFs, give students more opportunities to prepare for the exam while at university through curriculum, internships, and seasonal positions. 4. Explore why the diversity of graduates in forestry is not represented in the workforce, especially in the private industry. 5. Expand the conversation about the future of forestry to include environmental studies, natural resources, and similar fields to entice a broader demographic of students in the profession. <p>Registered Professional Foresters</p> <ol style="list-style-type: none"> 1. The exam pass rate is very low; there is a need to tailor university curriculum to prepare students for the exam. Universities could help students by partnering with employers to provide three-year opportunities to meet requirements. Programs could also consider further aligning curriculum with the RPF assessment. 2. Need further consideration to identify the optimal academic and practical curriculum to support increasing overall RPF numbers and the exam pass rate. <p>Internship and Training Opportunities</p> <ol style="list-style-type: none"> 1. Universities may need to take the lead in setting parameters and expectations if they are interested in developing student-oriented internship opportunities with partners. 2. Address barriers to participating in seasonal rural employment/internships for students where it is difficult to secure temporary housing and support/oversight. 3. Employers providing internships need more coordination with universities to support student workers - especially through providing subsidized or supplying seasonal housing. 4. More coordination from private companies to communicate and promote their opportunities to students. 5. Forestry programs should continue to compile a list of training opportunities to share with students and develop partnerships with industry, state, and federal agencies, and dedicate staff time to keeping these resources up to date. <p>University Admissions and Student Demographics</p> <ol style="list-style-type: none"> 1. Consider how academic thresholds for admissions requirements may limit potential students interested in forestry. Concern that students who are drawn to forestry are not accepted into university programs because of academic achievement barriers. 2. Need to see programs reach more diverse students and start the recruiting process at a younger age to get students excited about forestry.
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Source	Author	Publication Date	Recommendations
			<p><u>Community Colleges</u></p> <ol style="list-style-type: none"> 1. Starting at a community college and then transferring to a four-year program could lower barriers for future foresters. Use creative transfer partnerships with California Community Colleges to help students access higher-level forestry positions who might not otherwise take a traditional four-year degree path. 2. Use opportunities to build upon already existing partnerships/transfer relationships between community colleges and 4-year universities. 3. Community college partnerships could be leveraged to support shared on-the-job training opportunities with students. <p><u>Competing University Programs</u></p> <ol style="list-style-type: none"> 1. Lower cost of living and fewer forestry regulations may be drawing students to Oregon and Washington. California may need to address its forestry regulations and barriers to entry. 2. Opportunity to create a pipeline between natural resource programs and forestry positions to leverage the fact that the forestry field encompasses a wide variety of disciplines and skillsets. 3. Monitor the effects of AB 927. <p>Overall, there is a need to better communicate the essential role of forestry, forming better linkages to larger fields of study, and establishing clearer partnerships with community colleges so universities can engage a broader/more diverse pool of students. Strong verbal and written skills will also be important for new foresters.</p>
<u>What color is your Nomex?: Categorizing and quantifying the wildland fire response workforce</u>	Stanford Climate & Energy Policy Program	2025	<p>Recommends investment in the following areas of inquiry:</p> <ol style="list-style-type: none"> 1. Quantifying the number of days worked by individuals from different sectors of the workforce, in particular those in surge capacity roles such as non-fire staff, AD/casual hires, and contractors 2. Studying how individuals build careers in and move through the wildland fire response system. Understanding the reasons that individuals enter, stay within, or leave different sectors of the workforce can help inform strategies to recruit and retain employees in the field. 3. Analyzing the size and composition of the prescribed fire and/or fire mitigation workforce - a focused investigation into the prescribed workforce will improve understanding of what capacity currently exists for prescribed fire and how that matches need.

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			4. Updating the existing research that compares the cost of different resource types, in particular between contractors and federal personnel
Wildfire, Environmental, and Climate Resilience: Workforce-to-Careers Gap Analysis	Esther Feldman - Feldman Consulting	2023	<p>General Conservation Sector:</p> <p>1. Priority Recommendations. a) Make the public conservation sector known and visible, b) Improve alignment, consistency, and transferability of skills, knowledge, and job experience. Knowledge and experience should be transferable between job levels and agencies. These goals may require a dedicated workforce development job position</p> <p>2. External Workforce Development Programs. a) Exposure to and connection with nature - Fund projects that introduce youth, especially those from underserved communities, to the natural world and have middle and high school teachers introduce public conservation career opportunities to their students. Have more entry-level jobs and volunteer opportunities that can lead to careers in conservation with visible opportunities for advancement. It is especially important that employees understand career path options. b) Mentors and Professional Development. Provide mentorship and ongoing support with emphasis on helping entry-level employees understand career paths and education requirements. Add training for professional skills that will help with higher-level jobs and specify these skills on job descriptions c) Connect and Network with Community Colleges. This can help with better links to jobs in the conservation sector and make jobs in the sector more visible d) Address Cultural Definition Barriers through clarifying job definitions and emphasizing opportunities for upward mobility. e) Show the link between work experience, career options, and employers through a pathways guide. f) Provide examples of diverse conservation professionals and their careers through personal stories and local examples. g) Expand Workforce Development to Include Entry-to-Mid Level Jobs. h) Incorporate science-based training on native habitat restoration planning, native plant selection, and relevance to wildfire resilience. i) Host public conservation career development workshops as part of workforce development to show the link between many diverse fields in the conservation sector. Attendance should be required for all workforce development program participants and key grantee staff, and interns. j) Share expertise, knowledge, and training capacity. Share training from other organizations and take advantage of specific expertise, streamline resources between organizations. k) Network with Philanthropic leaders and foundations</p> <p>3. Improving Workforce Development Grants Issued. a) Establish Consistency in Knowledge, Skills, and Abilities Requirements. Knowledge, skills, and abilities should be transferable between employers within a region. b) Allow grant funds to be used for essential workforce development activities outside of overhead expenses. c) Require certain actions from all</p>

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			<p>grantees and include as eligible grant expenses - entry-level hires must complete training for a list of standard skills and knowledge, conduct skill assessments of incoming employees, conduct pre-and post-program surveys of entry-level employees, track and report on workforce development program results, provide an intro to public conservation professions. d) Provide grantees with exposure to staff and career pathways in the organization, rewarding the grant. e) Incentivize networking between non-profit grantees. f) Require that each grantee install public-facing communication and include funding in all grants for more publicity for workforce pathways/programs. g) Establish coordination between entry-level workforce development grantees, public agency employers, etc.</p> <p>Fire Division Workforce</p> <ol style="list-style-type: none"> 1. As seen above in more detail, provide courses on how things work and contextual framework (agency, natural resources, parks, partner agencies, indigenous people, government). 2. Increase interaction across divisions 3. Expand career advancement beyond the fire division 4. Create access to wildfire programs and training within communities in urban core areas 5. Recruit women and review gender policies, provide data management training, develop community college wildfire education that links with public agencies, improve pay scale to meet living costs,

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Workforce Development Strategic Plan: Building a Wildfire and Forest Resilience Economy	Workforce Subcommittee of the Wildfire and Forest Resilience Task Force	Unpublished	<ol style="list-style-type: none"> 1. Access Available Workers. Focus on those available and interested in the sector. Action items can include developing an online hub for "one-stop" for the application and job placement process, develop recruitment strategies in partnership with existing entities that currently work with available works, foster inclusive and safe communities especially in rural areas close to the work, partner with K-12 schools to reach rural youth, connect with Tribal communities, support organizations working on job placement and training for current/formerly incarcerated individuals, outreach to urban youth through existing job-placement programs to create opportunities in the forestry sector. 2. Locate Training in Communities and Contextualize Training Strategies. Expand training opportunities so workers don't have to leave their communities to gain training/employment. Training programs should emphasize job quality and quality of life, and also focus on rural infrastructure development, especially housing and broadband, create targets for workforce training, and engage trainers and leaders who are relatable and with diverse cultural backgrounds. 3. Link Training with Employment. Training entities should partner with employers so training always leads to work, remove barriers such as location/broadband/finances/transportation/etc, expand or develop the link between education to work through apprenticeships and partnerships with prospective employers 4. Tribal Leadership. Do this through building Tribal capacity to focus on homeland stewardship, foster cooperation with tribes across agencies, involve Tribal entities and the BIA in conducting post-catastrophic fire events, and provide direct funding for tribes to do work. 5. Prioritize Building Capacity in Priority Populations. Fund local liaisons, Tribal liaisons, and trainers with expertise in contracting and processes by which rural businesses and Tribal enterprises can obtain stewardship agreements and contracts, re-build local capacity of tribes post-fire, state funding should include elements to pay good forest restoration worker wages and benefits, create simplified and flexible federal and state contracting with local entities, give preference to organizations with DEIJ plans and active enforcement 6. Coordinate Efforts between Trainers, Employers, and Communities.

Source	Author	Publication Date	Recommendations
<u>Workforce Development: A Vision for the Future</u>	Sierra Institute	2024	<ol style="list-style-type: none"> 1. Access available workers: Begin and center efforts on those available and interested in being employed and pursuing a career path in the sector. This involves workforce training programs that understand the socioeconomic conditions, employment opportunities, wages, locations, demographics, and histories of the available workforce. 2. Infrastructure: Expand wood utilization infrastructure, wood campuses, research, and product development and marketing to speed the transition to using innovative, carbon-sequestering, and carbon-neutral wood products. 3. Locate Training in communities and contextualize training strategies: Training models that require workers to move out of a community are largely unsuccessful. Funding for training efforts must make critical determinations about where worker training happens. Workers should be trained where they live and where the work is located, using methods that align with the target workforce. 4. Link training with employment: Link training with employment, with the understanding that any gap between training and employment is detrimental to building a workforce. Failure to do so can lead to attrition, worker disenchantment, limitations on recruitment, and labor challenges. 5. Tribal leadership: A retooling of the forest industry must include targeted efforts to reach Tribal groups that have been historically excluded from the field and denied access to capital, among other barriers. Programs must acknowledge that Tribal land practices, such as cultural burning, were outlawed, contributing to the current state of the Sierra and other forests in California today. 6. Prioritize building capacity in priority populations: There is an acute need to build capacity within forested communities to grow businesses, capture investment, and utilize available contracting opportunities to increase the pace and scale of restoration and utilization. 7. Coordinate efforts between trainers, employers, and communities: Traditionally, the forest economy has operated within silos with limited knowledge sharing or mobility of employees. This has been detrimental to innovation in the sector, job quality, and opportunities for workers. 8. Improve job quality and increase employee retention by cross-training for year-round employment: Pillars of job quality include living wage jobs, worker job satisfaction, and the opportunity for permanent jobs. Workers expect safe, supportive, and inclusive environments. Funding and training efforts need to focus on training and restoration crew development on year-round rather than seasonal work. 9. Support Local Business Infrastructure: Many small businesses located near forests lack the capital they need to purchase needed equipment or compete for contracts with large corporations and out-of-state businesses. To sustain a long-term forest restoration workforce,

Source	Author	Publication Date	Recommendations
			<p>state funding efforts must prioritize the capacity of local businesses to compete for public contracts and include local preference, including local hiring in bidding processes.</p> <p>10. Housing: Workforce development efforts are intrinsically tied to housing availability. Both rural and urban areas face acute affordable housing shortages.</p> <p>11. Increase transparency surrounding forest jobs by capturing and sharing data: There is little available data on current training programs pertaining to key metrics, such as job placement, retention, wages, and wage progression. Similarly, there is no consensus on what industry-recognized credentials through a training program should offer.</p>
Workforce Development: Technical Memo for the State-Owned Lands Working Group		2023	<ol style="list-style-type: none"> 1. Equitable and Coordinated Hiring Practices and Pathways: 1) Create hiring preference guidelines 2) Create an online continuous exam for Forestry classifications 3) Increase the diversity and qualifications of the applicant pool by working with training programs and schools in areas with underrepresented communities and Tribes 4) Create a new hiring pathway program with community and four-year colleges, Tribes, and local and state corps who have certifications in implementing wildfire/landscape resilience, restoration and stewardship projects 5) Develop an online state jobs hub for recruitment, application submission, and job placement that supports the job classifications needed for wildfire and wildlands resilience work 2. Competitive Compensation (and Benefits) & Continued Training: 1) Geographic pay differential 2) Recognize, incorporate, and compensate the time in service and employment classification status of seasonal employees 3) Institute rehiring rights for seasonal employees 4) Create a specialized career path for wildfire/wildlands restoration workers to enable an integrated ecosystem approach for long-term wildfire risk reduction and ecological resiliency projects 5) Provide housing benefits to seasonal and implementation workers/crews 3. Expanded Contractor Partnerships and Exemptions: 1) Modify contracting guidelines or create new culturally appropriate guidelines to reflect the unique co-management/partnership/relationship between Tribes and the state government 2) Create simplified and expedited state contracting with local entities who are working with state agencies at a regional scale on resilience projects 3) Explore the feasibility of a Master "State Contracting Agreement" to facilitate expedited hiring/contracting between state and regional partners 4) Establish and support year-round Wildfire and Landscape Resilience CA Conservation Corps crews who work across state-owned lands 5) Create grant or local assistance funding mechanisms for local liaisons, Tribal liaisons, and trainers with expertise in contracting and processes through whom rural businesses and Tribal enterprises may obtain stewardship agreements/contracts to do wildland resiliency work 6) Allow for advance payments of up to

Source	Author	Publication Date	Recommendations
			<p>25% of contract value for small business, Tribes, and disabled veteran business enterprise performing wildfire and wildland resilience work 7) Extend encumbrance and expenditure authority for wildfire and wildlands management funds from three to five years</p> <p>4. Increased Number of Qualified Staff: 1) Expand the number of permanent state positions for wildfire/landscape resilience, restoration, and stewardship projects with hiring preference to Tribal and under-represented communities 2) Shift long-term seasonal employees to permanent, year-round positions with higher salaries and benefits and retain seasonal hires for peak wildfire/wildlands resilience activities 3) Create a database of qualified retired annuitants across state-owned lands who could be hired to support planning, data management, permitting, and implementation of priority projects</p> <p>5. Interagency and Partner Coordination: 1) Incentivize and empower Tribal, federal, and private sectors to collaborate on providing workforce support for state wildfire/wildland project implementation 2) Create a more accessible and streamlined system for any necessary contracting, agreements, and/or regulatory requirements allowing staff to move across and between state, federal and regional agencies 3) Share key technical and professional staff across state agencies, such as foresters, burn bosses, compliance specialists, etc.</p>
<u>Working in the Shadows: Safety and Health in Forestry Services in Southern Oregon</u>	Carl Wilmsen, Diane Bush, and Dinorah Barton-Antonio	2015	<p>"Agency policies should be strengthened so that inspection for labor law compliance becomes routine. To be efficient, these inspections could be combined with regular inspections of performance on the technical specifications of contracts. This may require additional training for agency inspectors. Because intense competition for contracts creates incentives for contractors to cut costs, policies should be put in place to encourage contractors to include the costs of safety training and daily safety briefings in their bid prices and to require consideration of these costs in the evaluation of bids. The fear of retaliation reported by survey respondents mirrors the results of studies of low-wage immigrant workers in other industries and suggests that a number of reforms may be needed to address health, safety, and workers' rights issues. Among these are reforming the H-2B program to allow forest workers holding these visas to participate in the free labor market and otherwise expanding the pool of legally authorized forest workers. Such reforms would give forest workers a more protected employment status that would allow them to report problems and suggest workplace improvements to employers and/or regulatory agencies."</p>

Appendix C: Questionnaire Results

- 63 subject-matter experts responded to the questionnaire, including 41 surveys and 22 interviews. Several interviews included multiple participants.
- Respondents work throughout the state. Some respondents work in multiple regions, while others work in one specific region (Figure 4).
- Respondents ranged in terms of the type of organization they work for and/or are affiliated with (Figure 5) and their role in workforce and career development (Figure 6).

Figure 4. California regional breakdown, based on the Task Force regions



Figure 5. Type of organization that respondents work for and/or are affiliated with

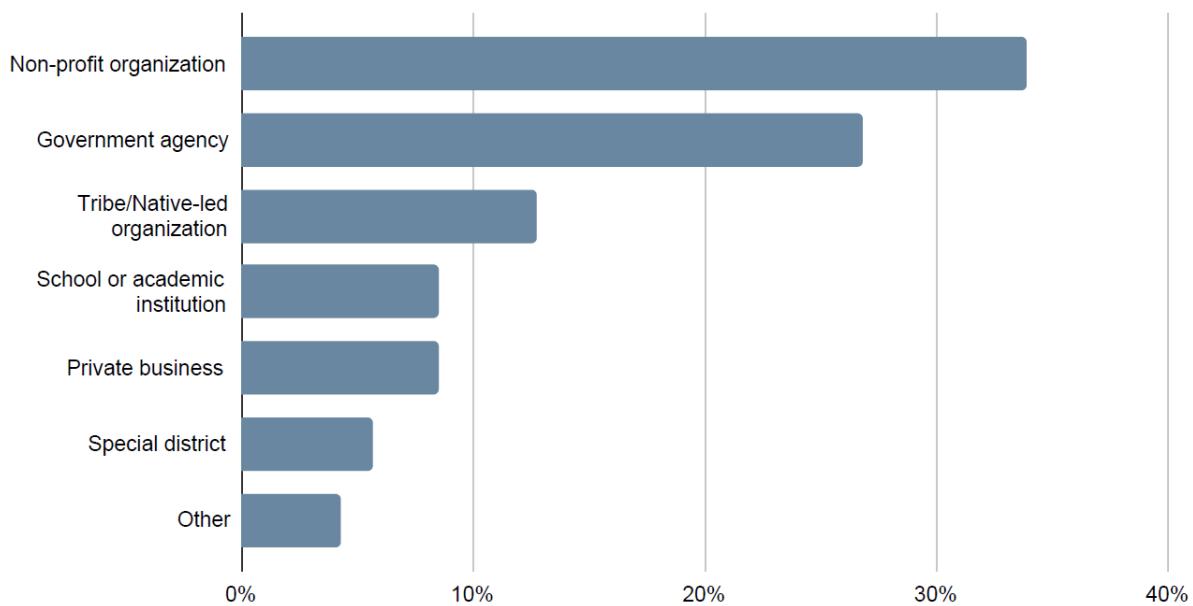


Figure 6. Respondents' role in workforce and career development

● Employer, 40% ● Trainer or Educator, 38% ● Funder, 17%
● Other, 6%

