

Wildland Fire Technology

Inland Empire/Desert Region (Riverside and San Bernardino counties combined)

This workforce demand report uses state and federal job projection data developed before the economic impact of COVID-19. The COE is monitoring the situation and will provide more information as it becomes available. Please consult with local employers to understand their current employment needs.

Summary

- Community college wildland fire technology programs prepare students to be forest fire inspectors and prevention specialists. The occupation is considered an **essential critical infrastructure occupation**.
- Employment for *forest fire inspectors and prevention specialists* is expected to **increase by 15% between 2019 and 2024**. A total of **nine annual job openings** will be available in the Region each year over the five-year timeframe.
- The **10th percentile hourly wage** for this occupation is **\$24.41 per hour, above the \$19.94 per hour self-sustainable hourly wage** estimate for a single adult with one child in the Region.
- There were **no awards issued** from regional community college programs related to wildland fire technology over the last three years.
- The COE **recommends caution** in creating new wildland fire technology programs due to the relevant occupation's low annual job openings.

Introduction

This report provides data on programs and occupations related to wildland fire technology. The California Community College wildland fire technology program prepares students for employment as forest fire inspectors and prevention specialists through the instruction of the principles and techniques of wildland firefighting including weather, topography, fuels, and fuel moisture as it affects wildland fire behavior. Wildland fire prevention and specific training in logistics, investigation, and management of large wildland fires (Taxonomy of Programs, 2012). The occupation closely aligned to this program is *forest fire inspectors and prevention specialists*.

Forest Fire Inspectors and Prevention Specialists (SOC 33-2022)

Enforce fire regulations, inspect forest for fire hazards, and recommend forest fire prevention or control measures. May report forest fires and weather conditions.

Sample job titles: Fire Management Officer, Fire Operations Forester, Fire Prevention Officer, Fire Prevention Technician, Fire Technician, Forest Officer, Forest Patrolman, Forestry Patrolman, Wildfire Mitigation Specialist, Wildfire Prevention Specialist

Entry-Level Educational Requirement: High school diploma or equivalent

Training Requirement: Between one and twelve months of on-the-job training

Incumbent workers with a Community College Award or Some Postsecondary Coursework: 58%

Forest fire inspectors and prevention specialists are considered an essential critical infrastructure occupation identified by the Public Policy Institute of California. This classification of occupations is vital in supporting California's basic economic and safety needs (Bohn et al.). Despite the ongoing pandemic, employment demand should continue due to this occupation's critical nature and social distance ability.

Job Opportunities

In 2019, there were 69 *forest fire inspector and prevention specialist* jobs in the Inland Empire/Desert Region (IEDR). This occupation is projected to increase employment by 15% through 2024. Employers are expected to have 53 job openings over the next five years to fill new jobs and backfill jobs that workers are permanently vacating (includes occupational transfers and retirements). Exhibit 1 displays five-year projected job growth in the IEDR.

Exhibit 1: Five-year projections for forest fire inspectors and prevention specialists, IEDR

2019 Jobs	2024 Jobs	5-Yr % Change (New Jobs)	5-Yr Openings (New + Replacement Jobs)	Annual Openings (New + Replacement Jobs)	% of workers age 55+
69	79	15%	53	9	~22%

Source: EMSI 2020.4

In 2019, there were 433 *forest fire inspector and prevention specialist* jobs in California. This occupation is projected to increase employment by 12% through 2024. Employers are expected to have 318 job openings over the next five years to fill new jobs and backfill jobs that workers are permanently vacating (includes occupational transfers and retirements). Exhibit 2 displays five-year projected job growth in California.

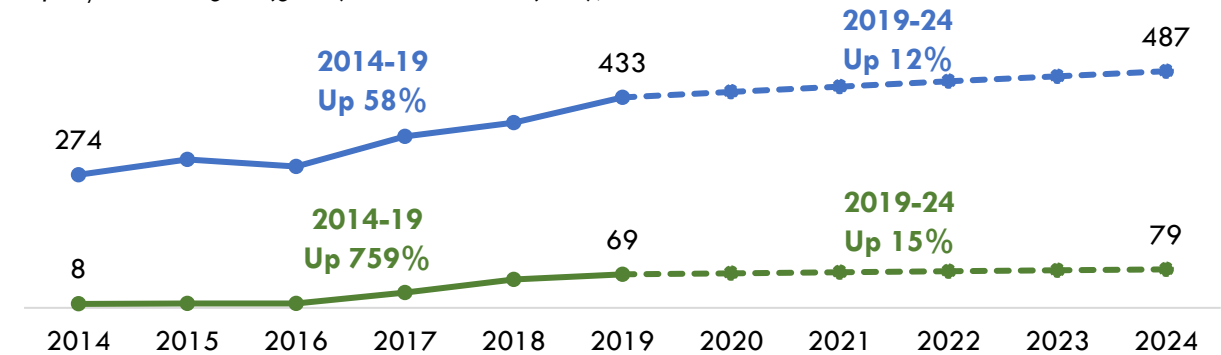
Exhibit 2: Five-year projections for forest fire inspectors and prevention specialists, California

2019 Jobs	2024 Jobs	5-Yr % Change (New Jobs)	5-Yr Openings (New + Replacement Jobs)	Annual Openings (New + Replacement Jobs)	% of workers age 55+
433	487	12%	318	53	28%

Source: EMSI 2020.4

Exhibit 3 displays historical (2014 to 2019) and projected (2019-2024) jobs for forest fire inspectors and prevention specialists in the Inland Empire/Desert Region and California.

Exhibit 3: Historical and projected jobs for forest fire inspectors and prevention specialists in the Inland Empire/Desert Region (green) and California (blue), 2014 – 2024



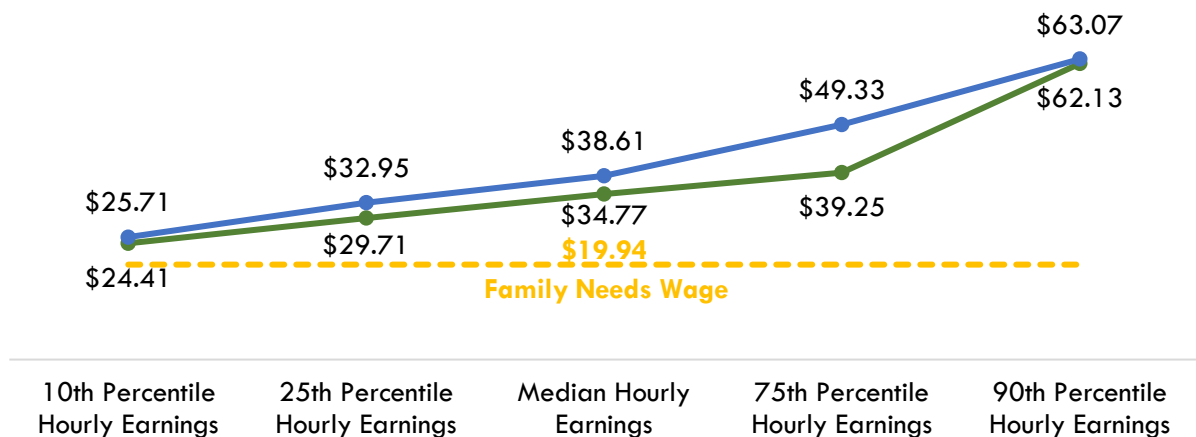
Source: EMSI 2020.4

Earnings and Benefits

Community colleges should ensure their training programs lead to employment opportunities that provide a self-sustainable level of income. The Family Needs Calculator estimates that a self-sustainable wage for a single adult with one school-age child is \$19.94 per hour or \$41,475 annually in Riverside County, \$19.49 per hour or \$40,539 annually in San Bernardino County (Pearce & Manzer, 2018). For this study, the higher hourly wage requirement in Riverside County is adopted as the self-sufficiently standard for the two-county Region.

The 10th percentile hourly wage for forest fire inspectors and prevention specialists is above the Family Needs Calculator self-sustainability rate, indicating that 90% of workers in the field earn wages above the self-sustainability rate. Exhibit 4 displays the hourly earnings for forest fire inspectors and prevention specialists in the IEDR and California.

Exhibit 4: Hourly earnings for forest fire inspectors and prevention specialists in the IEDR (green) and California (blue)



Source: EMSI 2020.4

While the occupational guides developed by the California Labor Market Information Division typically provide benefit information, this information is not available for *forest fire inspectors and prevention specialists* (Detailed Occupational Guides, 2020).

Job Advertisements

Exhibit 5 displays the number of job ads posted during the last five years in California. Job advertisement data reveals few forest fire inspectors and prevention specialists' opportunities in the Region and state. Only one of the 18 total job ads posted for this occupation over the last five years was located in the IEDR. The average time to fill for *forest fire inspectors and prevention specialists* in California is 52 days.

Exhibit 5: Job ads and time to fill

Occupation	Job Ads	California Average Time to Fill (Days)
Forest Fire Inspectors and Prevention Specialists	18	52

Source: Burning Glass – Labor Insights

Employers, Skills, Education, and Work Experience

Exhibit 6 displays all the employers who posted advertisements for *forest fire inspectors and prevention specialists* over the last five years in the state.

Exhibit 6: Employers posting the most job ads for forest fire inspectors and prevention specialists

Employers	Job Ads
US Forest Service	11
National Park Service	2
US Department of Agriculture	2
Sierra Pacific Industries	2
Woodbridge Fire District	1
Total	18

Source: Burning Glass – Labor Insights

Exhibit 7 displays a sample of specialized and employability skills employers sought when looking for workers to fill *forest fire inspector and prevention specialist* positions. Specialized skills are occupation-specific skills that employers request for industry or job competency. Employability skills are foundational skills that transcend industries and occupations; this category is often referred to as "soft skills." The skills requested in job postings may be utilized as a helpful guide for curriculum development.

Exhibit 7: Sample of in-demand skills from employer job ads

Specialized Skills	Employability Skills
<ul style="list-style-type: none"> Wildlife Management Range Management Scheduling Fire Suppression Resource Management 	<ul style="list-style-type: none"> English Research Planning Communication Skills Building Effective Relationships

Source: Burning Glass – Labor Insights

Exhibit 8 displays the entry-level education typically required to become a *forest fire inspector and prevention specialist* according to the Bureau of Labor Statistics (BLS), educational attainment for incumbent workers with "some college, no degree" and an "associate degree" according to the U.S. Census (2016-17) and the real-time minimum advertised education requirement from employer job ads.

Exhibit 8: Typical entry-level education, educational attainment, and minimum advertised education requirements for forest fire inspectors and prevention specialists

Occupation	Typical Entry-Level Education Requirement	CC-Level Educational Attainment*	Real-Time Minimum Advertised Education Requirement			
			Number of Job Ads	High school diploma or vocational training	Associate degree	Bachelor's degree or higher
Forest Fire Inspectors and Prevention Specialists	High school diploma or equivalent	58%	15	100%	-	-

Source: EMSI 2020.4, Burning Glass – Labor Insights

*Percentage of incumbent workers with a Community College Award or Some Postsecondary Coursework

Exhibit 9 displays the work experience typically required for *forest fire inspectors and prevention specialists* and the real-time work experience requirements from employer job ads.

Exhibit 9: Work experience required and real-time work experience requirements

Occupation	Work Experience Typically Required	Real-Time Work Experience			
		Number of Job Ads	0 – 2 years	3 – 5 years	6+ years
Forest Fire Inspectors and Prevention Specialists	Less than 5 years	17	88%	-	12%

Source: EMSI 2020.4, Burning Glass – Labor Insights

Certifications

Exhibit 10 displays the certifications required by employers posting job ads for *forest fire inspectors and prevention specialists* in the state. The Work Capacity Test (WCT), administered by the National Wildfire Coordinating Group (NWCG), ensures a person is physically capable of meeting the minimum fitness requirement associated with wildfire (NWCG, 2020).

Exhibit 10: Certifications required by employer job ads for forest fire inspectors and prevention specialists

Occupation	Certifications
Forest Fire Inspectors and Prevention Specialists (n=11)	<ul style="list-style-type: none"> Work Capacity Test (WCT)

Source: Burning Glass – Labor Insights

Wildland Fire Technology

This section of the report provides additional job advertisement information related to wildland fire technology. To broaden the job advertisement search for wildland fire technology, the occupation, firefighters (33-2011), was added to the search. The wildland fire technology job posting search yielded 337 total job advertisements listed over the last year in California. The majority of wildland fire technology job postings were listed for *firefighters* and not *forest fire inspectors and prevention specialists*.

The California Conservation Corps is the largest employer in the state, accounting for 14% (46 ads) of statewide ads. Most employers posting advertisements are local and regional fire agencies, such as the City of Rialto. Approximately 12% of statewide job postings were located in the Inland Empire/Desert Region. Job advertisement data does not provide additional insight into the special skills, education, training, and certifications required by wildland firefighters.

Program Outcomes

There were no awards issued for wildland fire technology programs in the Region. Exhibit 11 details program outcomes recorded in wildland fire technology (2133.10) programs. California program outcome

data may provide a useful insight into the likelihood of success for the proposed program. Dashes indicate there were too few students from which to obtain reliable program outcome information. The outcome methodology is available in the appendix section of this report.

Exhibit 11: 2133.10 – Wildland fire technology strong workforce program outcomes

Strong Workforce Program Metrics: 2133.10 – Wildland Fire Technology Academic Year 2017-18, unless noted otherwise	Inland Empire/Desert Region	California
Unduplicated count of enrolled students (2018-19)	177	3,290
Completed 9+ career education units in one year (2018-19)	19%	13%
Perkins Economically disadvantaged students (2018-19)	69%	69%
Students who attained a noncredit workforce milestone in a year (2018-19)	-	-
Students who earned a degree, certificate, or attained apprenticeship (2018-19)	-	42
Transferred to a four-year institution (transfers)	-	24
Job closely related to the field of study (2016-17)	-	64%
Median annual earnings (all exiters)	\$35,040	\$27,426
Median change in earnings (all exiters)	80%	42%
Attained a living wage (completers and skills-builders)	59%	57%

Sources: LaunchBoard Community College Pipeline and Strong Workforce Program Metrics

Recommendation

Community college wildland fire technology programs (TOP 2133.10) provide the knowledge, skills, and abilities that lead to the *forest fire inspectors and prevention specialists* occupation. This occupation is considered an essential critical infrastructure occupation. Despite the ongoing pandemic, employment demand should continue due to the critical health and safety services provided by this classification of workers. In the Region, *forest fire inspectors and prevention specialists* are projected to have nine annual job openings, increasing employment by 15% through 2024. This occupation offers a median hourly wage of \$34.25 per hour, above the \$19.94 per hour self-sustainability standard for a single adult with one child in the Region. This occupation typically requires a high school diploma or equivalent; all employer online job ads were searching for a candidate with a high school diploma or vocational training as a minimum educational requirement.



There were **no awards issued** from regional community college programs related to wildland fire technology over the last three academic years. According to Strong Workforce metrics, 59% of students attained a living wage after exiting a program containing this course TOP code, compared to 57% at the state level.

The COE recommends caution in creating new wildland fire technology programs due to the relevant occupation's low annual job openings. It should be noted that this occupation offers a high median wage. Colleges considering the wildland fire technology program should add the training outcomes from this program to existing fire technology programs. Please consult with local employers and their need for more workers in this field.

Contact

Michael Goss & Paul Vaccher
Centers of Excellence, Inland Empire/Desert Region
michael.goss@chaffey.edu
November 2020

References

Bohn, S., Cuellar Mejia, M., Lafortune, J. (2020). Essential Workers and COVID-19 - Public Policy Institute of California. Retrieved from <https://www.ppic.org/blog/essential-workers-and-covid-19/>

Burning Glass Technologies. (2020). *Labor Insights/Jobs*. Retrieved from <https://www.burning-glass.com/>

California Community Colleges Chancellor's Office. LaunchBoard. (2020). *California Community Colleges LaunchBoard*. Retrieved from <https://www.calpassplus.org/Launchboard/Home.aspx>

California Community Colleges Chancellor's Office. LaunchBoard. (2020a). *Strong Workforce Program Metrics Data Element Dictionary*. Pg. 3. Retrieved from <https://www.calpassplus.org/MediaLibrary/calpassplus/launchboard/Documents/SWP-DED.PDF>

California Community Colleges Chancellor's Office. (2020). *Chancellor's Office Curriculum Inventory (COCI), version 3.0*. Retrieved from <https://coci2.ccctechcenter.org/programs>

California Community Colleges Chancellor's Office Management Information Systems (MIS) Data Mart. (2020). *Data Mart*. Retrieved from <https://datamart.cccco.edu/datamart.aspx>

California Community Colleges Chancellor's Office, Curriculum and Instructional Unit, Academic Affairs Division. (2012). *Taxonomy of Programs, 6th Edition, Corrected Version*. Retrieved from <https://www.cccco.edu/-/media/CCCCO-Website/About-Us/Divisions/Digital-Innovation-and-Infrastructure/Research/Files/TOPmanual6200909corrected12513.ashx?la=en&hash=94C709CA83C0380828415579395A5F536736C7C1>

Carnevale, A. P., Jayasundera, T., & Repnikov, D. (n.d.). Understanding Online Job Ads Data. Retrieved from <https://cew.georgetown.edu/wp-content/uploads/2014/11/OCLM.Tech.Web.pdf>

Economic Modeling Specialists International (EMSI). (2020). *Datarun 2020.4*. Retrieved from <https://www.economicmodeling.com/>

Labor Market Information Division. Employment Development Department of California. (2020). *Detailed Occupational Guides*. Retrieved from <https://www.labormarketinfo.edd.ca.gov/OccGuides/Search.aspx>

National Center for O*NET Development. (2020). *O*NET OnLine*. Retrieved from <https://www.onetonline.org/>

National Wildlife Coordinating Group (NWCG). (2020). *Work Capacity Test (WCT)*. Retrieved from <https://www.nwcg.gov/term/glossary/work-capacity-test-wct>

Pearce, D., Manzer, L. Center for Women's Welfare at the University of Washington. (2018). Retrieved from <https://insightcced.org/2019-family-needs-calculator/>

Appendix: Program Completion and Outcome Methodology

Community college student outcome information is from LaunchBoard and based on the selected TOP code and Region. These metrics are based on records submitted to the California Community Colleges Chancellor's Office Management Information Systems (MIS) by community colleges, which come from self-reported student information from CCC Apply and the National Student Clearinghouse. Employment and earnings metrics are sourced from records provided by California's Employment Development Department's Unemployment Insurance database. When available, outcomes for completers are reported to demonstrate the impact that earning a degree or certificate can have on employment and earnings. For more information on the types of students included for each metric, please see the web link for LaunchBoard's Strong Workforce Program Metrics Data Element Dictionary in the References section (LaunchBoard, 2020a). Finally, employment in a job closely related to the field of study comes from self-reported student responses on the CTE Employment Outcomes Survey (CTEOS), administered by Santa Rosa Junior College (LaunchBoard, 2020a).

Job postings data is limited to the information provided by employers and the ability of artificial intelligence search engines to identify this information. Additionally, preliminary calculations by Georgetown Center on Education and the Workforce found that "just 30 to 40 percent of openings for candidates with some college or an associate degree, and only 40 to 60 percent of openings for high school diploma holders appear online" (Carnevale et al., 2014). Online job postings often do not reveal the hiring intentions of employers; it is unknown if employers plan to hire one or multiple workers from a single online job posting, or if they are collecting resumes for future hiring needs. A closed job posting may not be the result of a hired worker.

Table 1: 2019 to 2024 job growth, wages, education, training, and work experience required for the forest fire inspectors and prevention specialists, IEDR

Occupation (SOC)	2019 Jobs	5-Yr Change	5-Yr % Change	Annual Openings (New + Replacement Jobs)	Entry-Experienced Hourly Wage Range (25 th to 75 th percentile)	Median Hourly Wage (50 th percentile)	Average Annual Earnings	Typical Entry-Level Education & On-The-Job Training Required	Work Experience Required
Forest Fire Inspectors and Prevention Specialists (33-2022)	69	10	15%	9	\$29.71 to \$39.25	\$34.77	\$77,400	High school diploma and 1-12 months	Less than 5 years

Source: EMSI 2020.4

Table 2: 2019 to 2024 job growth, wages, education, training, and work experience required for the forest fire inspectors and prevention specialists, California

Occupation (SOC)	2019 Jobs	5-Yr Change	5-Yr % Change	Annual Openings (New + Replacement Jobs)	Entry-Experienced Hourly Wage Range (25 th to 75 th percentile)	Median Hourly Wage (50 th percentile)	Average Annual Earnings	Typical Entry-Level Education & On-The-Job Training Required	Work Experience Required
Forest Fire Inspectors and Prevention Specialists (33-2022)	433	54	12%	53	\$32.95 to \$49.33	\$38.61	\$86,400	High school diploma and 1-12 months	Less than 5 years

Source: EMSI 2020.4