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# Labor Market Analysis

## Forestry Technician-Fire Suppression



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Prepared by the Central Valley/Mother Lode Center of Excellence

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**COVID-19 Statement:** This report includes employment projection data by Emsi. Emsi’s projections are modeled on recorded (historical) employment figures and incorporate several underlying assumptions, including the assumption that the economy during the projection period will be at approximately full employment or potential output. To the extent that a recession or labor shock, such as the economic effects of COVID-19, can cause long-term structural change, they may impact the projections. At this time, it is not possible to quantify the impact of COVID-19 on projections of industry and occupational employment. Other measures such as unemployment rates and monthly industry employment estimates will reflect the most recent information on employment and jobs in the state and, in combination with input from local employers, may help validate current and future employment needs as depicted here.

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# Summary

Please note the COVID-19 statement on page 2 when considering this report's findings.

This study conducted by the Central Valley/Mother Lode Center of Excellence examines labor market demand, wages, skills, and postsecondary supply for Forestry Technician-Fire Suppression. Three occupations related to Forestry Technician-Fire Suppression were identified for Reedley College:

- 19-4071, Forest and Conservation Technicians
- 33-2011, Firefighters
- 45-4011, Forest and Conservation Workers

## Key findings:

- **Occupational demand** — Nearly 3,240 workers were employed in jobs related to Forestry Technician-Fire Suppression in 2021 in the South Central Valley/Southern Mother Lode (SCV/SML) subregion. The largest occupation is firefighters with 2,302 workers, a projected growth rate of 5% over the next five years, and 196 annual openings.
- **Wages** — Firefighters earn the highest entry-level wage, \$224.98/hour in the subregion.
- **Employers** — Employers with the most job postings in the subregion are Wildfire Defense Systems, Forest Service, and The Great Basin Institute.
- **Occupational titles** — The most common occupational title in job postings in the subregion is Municipal Firefighters. The most common job title is Forestry Technician.
- **Skills and certifications** — The top baseline skill is physical abilities, the top specialized skill is safety training, and the top software skill is Microsoft Office. The most in-demand certification is a driver's license.
- **Education** — A high school diploma or equivalent is typically required for forest and conservation workers. A postsecondary nondegree award is typically required for firefighters. An associate degree is typically required for forest and conservation technicians.
- **Supply** — Analysis of postsecondary completions shows that on average 164 awards were conferred in the Central Valley/Mother Lode region each year.

Based on a comparison of occupational demand and supply, there is an undersupply of 201 trained workers in the subregion and 404 workers in the region. Please note all firefighters need to complete an academy to become firefighters in the state of California. The Center of Excellence recommends that Reedley College work with the regional directors, the college's advisory board, and local industry in the expansion of programs to address the shortage of Forestry Technician-Fire Suppression workers in the region.

# Introduction

The Central Valley/Mother Lode Center of Excellence was asked by Reedley College to provide labor market information for Forestry Technician-Fire Suppression. The geographical focus for this report is the South Central Valley/Southern Mother Lode (SCV/SML) subregion, but regional demand and supply data has been included for broader applicability and use. The average living wage for a single adult in the SCV/SML subregion is \$11.91/hour.<sup>1</sup> Analysis of the program and occupational data related to Forestry Technician-Fire Suppression resulted in the identification of applicable occupations. The Standard Occupational Classification (SOC) System codes and titles used in this report are:

- 19-4071, Forest and Conservation Technicians
- 33-2011, Firefighters
- 45-4011, Forest and Conservation Workers

The occupational titles, job descriptions, sample job titles, and knowledge and skills from the Bureau of Labor Statistics and O\*NET OnLine are shown below.

## **Forest and Conservation Technicians**

**Job Description:** Provide technical assistance regarding the conservation of soil, water, forests, or related natural resources. May compile data pertaining to size, content, condition, and other characteristics of forest tracts under the direction of foresters, or train and lead forest workers in forest propagation and fire prevention and suppression. May assist conservation scientists in managing, improving, and protecting rangelands and wildlife habitats.

**Knowledge:** Public Safety and Security, English Language, Customer and Personal Service, Law and Government, Administration and Management

**Skills:** Active Listening, Critical Thinking, Reading Comprehension, Judgment and Decision Making, Speaking

## **Firefighters**

**Job Description:** Control and extinguish fires or respond to emergency situations where life, property, or the environment is at risk. Duties may include fire prevention, emergency medical service, hazardous material response, search and rescue, and disaster assistance.

**Knowledge:** Public Safety and Security, Building and Construction, Customer and Personal Service, Education and Training, Mechanical

**Skills:** Active Listening, Monitoring, Coordination, Operations Monitoring, Critical Thinking

## **Forest and Conservation Workers**

**Job Description:** Under supervision, perform manual labor necessary to develop, maintain, or protect areas such as forests, forested areas, woodlands, wetlands, and rangelands through such activities as raising and transporting seedlings; combating insects, pests, and diseases harmful to plant life; and building structures to control water, erosion, and leaching of soil. Includes forester aides, seedling pullers, tree planters, and gatherers of nontimber forestry products such as pine straw.

**Knowledge:** Geography, English Language, Public Safety and Security, Administrative, Biology

**Skills:** Coordination, Speaking, Active Listening, Critical Thinking, Judgment and Decision Making

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<sup>1</sup> The term "living wage" in Center of Excellence reports is calculated by averaging the self-sufficiency wages from the Insight Center's California Family Needs Calculator for each county in the subregion: <https://insightccd.org/tools-metrics/self-sufficiency-standard-tool-for-california/>.

# Occupational Demand

The SCV/SML subregion employed 3,234 workers in Forestry Technician-Fire Suppression occupations in 2021 (Exhibit 1). The largest occupation is firefighters with 2,302 workers. This occupation is projected to grow by 5% over the next five years and has the greatest number of projected annual openings, 196.

**Exhibit 1: Forestry Technician-Fire Suppression employment and occupational projections in the SCV/SML subregion**

Occupation	2021 Jobs	2026 Jobs	5-Year Change	5-Year % Change	Annual Openings
Firefighters	2,302	2,410	108	5%	196
Forest and Conservation Workers	453	463	10	2%	74
Forest and Conservation Technicians	480	489	9	2%	62
<b>TOTAL</b>	<b>3,234</b>	<b>3,361</b>	<b>127</b>	<b>4%</b>	<b>332</b>

# Wages

Exhibit 2 shows the entry-level hourly wages of the Forestry Technician-Fire Suppression occupations. Forest and conservation technicians earn the highest entry-level wage, \$15.46/hour in the subregion<sup>2</sup>.

**Exhibit 2: Forestry Technician-Fire Suppression entry-level wages in the SCV/SML subregion**



# Job Postings

There were 110 job postings for the three occupations in the SCV/SML subregion from November 2021 to April 2022.<sup>3</sup> The employers with the most job postings are listed in Exhibit 3.

<sup>2</sup> Entry-level wages are derived from the 25<sup>th</sup> percentile.

<sup>3</sup> Other than occupation titles and job titles, the categories below can be counted one or multiple times per job posting, and across several areas in a single posting. For example, a skill can be counted in two different skill types, and an employer can indicate more than one education level.

**Exhibit 3: Top employers of Forestry Technician-Fire Suppression by number of job postings**

Employer	Job Postings	% Job Postings
Wildfire Defense Systems	26	27%
Forest Service	12	13%
The Great Basin Institute	6	6%
California Public Utilities Commission	3	3%
Commander	3	3%
County Tulare	3	3%
Kern County	3	3%
American Conservation Experience	2	2%
Chloeta	2	2%
City Of Dinuba	2	2%

Exhibit 4 shows how job postings for the targeted occupations in the SCV/SML subregion are distributed across four O\*NET OnLine occupations. The occupational title Municipal Firefighters is listed in 52 job postings. Note how this occupational title dominates the job posting results. Common job titles in postings include Forestry Technician in six job postings, Extra Help - Firefighter in five job postings, and Signature Gatherer in four job postings.

**Exhibit 4: Top occupational titles in job postings for Forestry Technician-Fire Suppression**

Occupational Title	Job Postings	% of Job Postings
Municipal Firefighters	52	47%
Forest and Conservation Technicians	39	35%
Forest and Conservation Workers	16	15%
Forest Firefighters	3	3%

**Salaries**

Exhibit 5 shows the “Market Salaries” for Forestry Technician-Fire Suppression occupations. These are calculated by Burning Glass using a machine learning model built off of millions of job postings every year. This accounts for adjustments based on locations, industry, skills, experience, education requirements, among other variables.

**Exhibit 5: Salaries for Forestry Technician-Fire Suppression occupations**

Market Salary Percentile	Salary Amount
10th Percentile	\$30,230
25th Percentile	\$33,713
50th Percentile	\$38,185
75th Percentile	\$43,957
90th Percentile	\$52,258

**Education**

Of the 110 job postings, 34 listed an education level preferred for the positions being filled. Among those, 53% requested a bachelor’s degree, 50% requested high school or vocational training, and 15%

requested a master’s degree (Exhibit 6). A job posting can indicate more than one education level. Hence, the percentages shown in the chart below may total more than 100%.

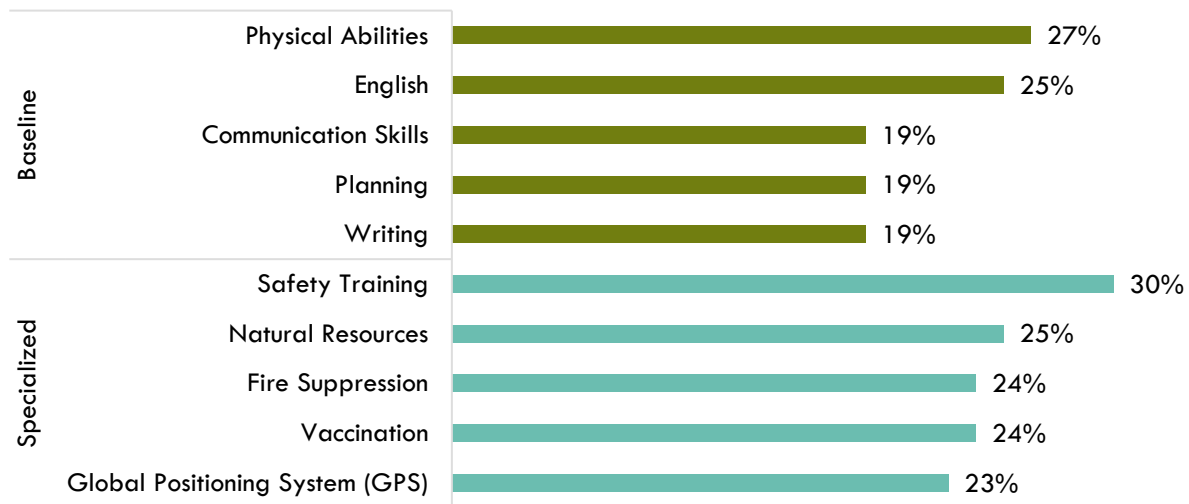
**Exhibit 6: Education levels requested in job postings for Forestry Technician-Fire Suppression**

Education Level	Job Postings	% of Job Postings
Bachelor's degree	18	53%
High school or vocational training	17	50%
Master's degree	5	15%
Associate's degree	1	3%

**Baseline and Specialized Skills**

Exhibit 7 depicts the top baseline and specialized skills for the targeted occupations. The three most important baseline skills are physical abilities, 27% of job postings, English, 25%, and communication skills, 19%. The top three specialized skills are safety training, 30% of job postings, natural resources, 25%, and fire suppression, 24%.

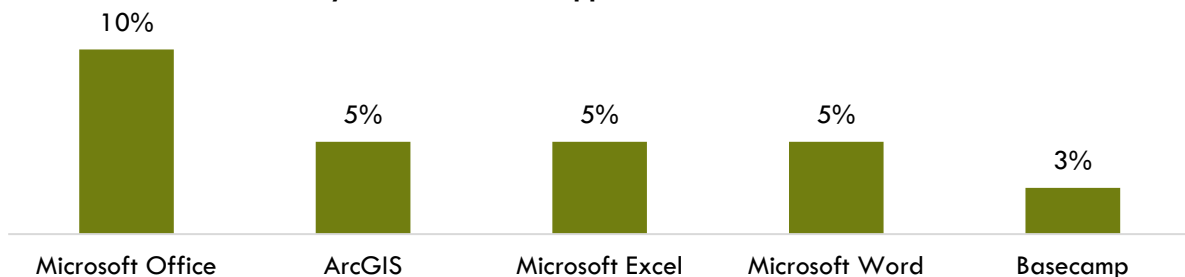
**Exhibit 7: In-demand Forestry Technician-Fire Suppression baseline and specialized skills**



**Software Skills**

Analysis also included the software skills most in demand by employers. Microsoft Office and ArcGIS were the top two software skills identified in job postings (Exhibit 8).

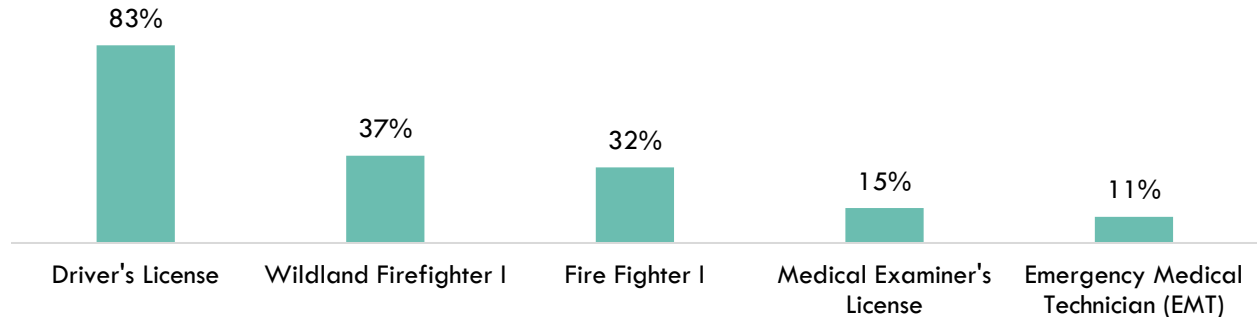
**Exhibit 8: In-demand Forestry Technician-Fire Suppression software skills**



## Certifications

Of the 101 job postings, 82 contained certification data. Among those, 83% indicated a need for a driver's license. The next top certifications are Wildland Firefighter I and firefighter 1 (Exhibit 9).

**Exhibit 9: Top Forestry Technician-Fire Suppression certifications requested in job postings**



## Education, Work Experience & Training

A high school diploma or equivalent is typically required for forest and conservation workers. A postsecondary nondegree award is typically required for firefighters. An associate degree is typically required for forest and conservation technicians (Exhibit 10).

**Exhibit 10: Education, work experience, training, and Current Population Survey results for Forestry Technician-Fire Suppression occupations<sup>4</sup>**

Occupation	Typical Entry-level Education	Work Experience Required	Typical On-The-Job Training	CPS
Firefighters	Postsecondary nondegree award	None	Long-term	59.4%
Forest and Conservation Workers	High school diploma or equivalent	None	Moderate-term	24.4%
Forest and Conservation Technicians	Associate's degree	None	None	37.1%

<sup>4</sup> "Labor Force Statistics from the Current Population Survey," Bureau of Labor Statistics, <https://www.bls.gov/cps/>.



# Supply

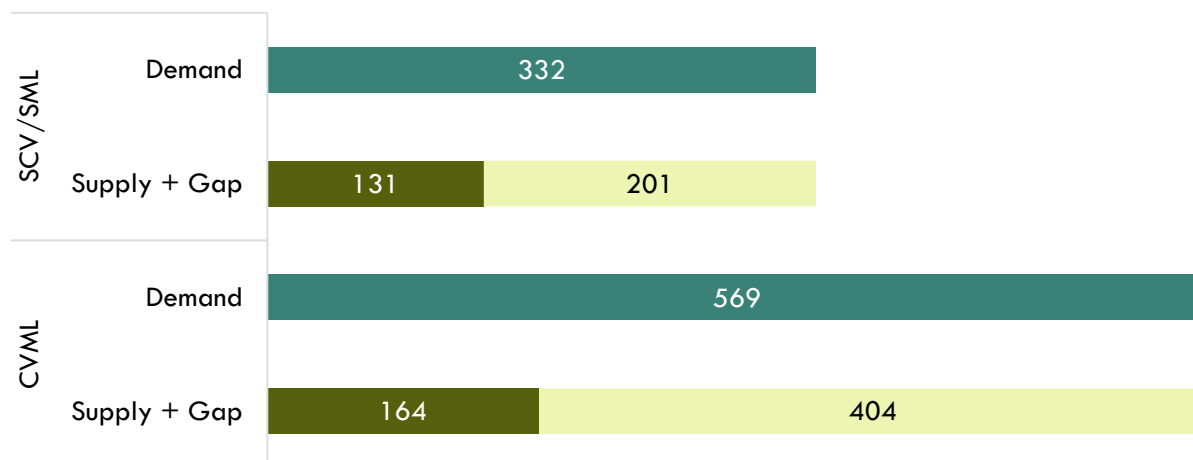
Analysis of program data from the Integrated Postsecondary Education Data System (IPEDS) included the TOP codes and titles: 011400 – Forestry, 213310 - Wildland Fire Technology, and 213350 - Fire Academy. Analysis of the last three years of data shows that, on average, 61 awards were conferred in the Central Valley/Mother Lode region each year (Exhibit 11).

**Exhibit 11: Postsecondary supply for Forestry Technician-Fire Suppression occupations in the region**

TOP/CIP Code- Title	College	Associate Degree	Certificate 16 < 30 Semester Units	Certificate 18 < 30 Semester Units	Certificate 30 < 60 Semester Units	Certificate 6 < 18 Semester Units	Subtotal
011400 - Forestry	Bakersfield	19			2		21
	Columbia	11			4	2	16
	Reedley College	10	5	9			23
213310 - Wildland Fire Technology	Bakersfield	3				0	3
	Porterville					18	18
213350 - Fire Academy	Fresno City		7	16			24
	Modesto					17	17
	Sequoias					42	42
<b>TOTAL</b>		<b>42</b>	<b>12</b>	<b>25</b>	<b>6</b>	<b>79</b>	<b>164</b>

There is an undersupply of 201 Forestry Technician-Fire Suppression workers in the SCV/SML subregion and 404 workers in the region (Exhibit 12).

**Exhibit 12: Forestry Technician-Fire Suppression workforce demand (annual job openings), postsecondary supply of students (awards), and additional students needed to fill gap in the SCV/SML subregion and region**



# Student Outcomes

Exhibit 13 summarizes employment and wage outcomes from the California Community College Chancellor’s Cal-PASS Plus LaunchBoard for the TOP code related to Forestry Technician-Fire Suppression. Of note, 34 forestry students received a degree or certificate or attained apprenticeship journey status; 66 students transferred; 75% of students obtained a job closely related to their field of study; 63% had a median change in earnings; and 59% of students attained a living wage.

**Exhibit 13: Subregional metrics for the TOP code related to Forestry Technician-Fire Suppression**

Metric	Forestry 011400	Wildland Fire Technology 213310	Fire Academy 213350
Students Who Got a Degree or Certificate or Attained Apprenticeship Journey Status	34	*	23
Number of Students Who Transferred	66	*	*
Job Closely Related to Field of Study	75%	*	100%
Median Change in Earnings	63%	2%	23%
Attained a Living Wage	59%	77%	94%
* denotes data not available.			

## Conclusion

The entry-level wages of the three occupations exceed the SCV/SML subregion’s average living wage. There were 110 job postings in the past six months for occupations related to Forestry Technician-Fire Suppression in the subregion. Analysis of skills and certification requirements in job postings indicates:

- The top baseline skill is physical abilities, and the top specialized skill is safety training.
- The top software skill is Microsoft Office.
- The top certification is a driver's license.

There is an undersupply of trained workers, a shortage of 201 in the SCV/SML subregion and 404 in the region. Please note all firefighters need to complete an academy to become firefighters in the state of California.

## Recommendation

Based on these findings, it is recommended that Reedley College work with the regional directors, the college’s advisory board, and local industry in the expansion of programs to address the shortage of Forestry Technician-Fire Suppression workers in the region.

# Appendix A: Methodology & Data Sources

## Data Sources

Labor market and educational supply data compiled in this report derive from a variety of sources. Data were drawn from external sources, including the Economic Modeling Specialists, Inc., the California Community Colleges Chancellor’s Office Management Information Systems Data Mart and the National Center for Educational Statistics (NCES) Integrated Postsecondary Education Data System (IPEDS). Below is the summary of the data sources found in this study.

Data Type	Source
Labor Market Information/Population Estimates and Projections/Educational Attainment	Economic Modeling Specialists, Intl. (EMSI). EMSI occupational employment data are based on final EMSI industry data and final EMSI staffing patterns. Wage estimates are based on Occupational Employment Statistics (QCEW and Non-QCEW Employees classes of worker) and the American Community Survey (Self-Employed and Extended Proprietors). Occupational wage estimates also affected by county-level EMSI earnings by industry: <a href="http://economicmodeling.com">economicmodeling.com</a> .
Typical Education Level and On-the-job Training	Bureau of Labor Statistics (BLS) uses a system to assign categories for entry-level education and typical on-the-job training to each occupation for which BLS publishes projections data: <a href="https://www.bls.gov/emp/tables/educational-attainment.htm">https://www.bls.gov/emp/tables/educational-attainment.htm</a> .
Labor Force, Employment and Unemployment Estimates	California Employment Development Department, Labor Market Information Division: <a href="http://labormarketinfo.edd.ca.gov">labormarketinfo.edd.ca.gov</a> .
Job Posting and Skills Data	Burning Glass: <a href="http://burning-glass.com/">burning-glass.com/</a> .
Additional Education Requirements/ Employer Preferences	The O*NET Job Zone database includes over 900 occupations as well as information on skills, abilities, knowledge, work activities and interests associated with specific occupations: <a href="http://onetonline.org">onetonline.org</a> .

## Key Terms and Concepts

**Annual Job Openings:** Annual openings are calculated by dividing the number of years in the projection period by total job openings.

**Education Attainment Level:** The highest education attainment level of workers age 25 years or older.

**Employment Estimate:** The total number of workers currently employed.

**Employment Projections:** Projections of employment are calculated by a proprietary Economic Modeling Specialists, Intl. (EMSI) formula that includes historical employment and economic indicators along with national, state and local trends.

**Living Wage:** The cost of living in a specific community or region for one adult and no children. The cost increases with the addition of children.

**Occupation:** An occupation is a grouping of job titles that have a similar set of activities or tasks that employees perform.

**Percent Change:** Rate of growth or decline in the occupation for the projected period; this does not factor in replacement openings.

**Replacements:** Estimate of job openings resulting from workers retiring or otherwise permanently leaving an occupation. Workers entering an occupation often need training. These replacement needs, added to job openings due to growth, may be used to assess the minimum number of workers who will need to be trained for an occupation.

**Total Job Openings (New + Replacements):** Sum of projected growth (new jobs) and replacement needs. When an occupation is expected to lose jobs, or retain the current employment level, number of openings will equal replacements.

**Typical Education Requirement:** represents the typical education level most workers need to enter an occupation.

**Typical On-The-Job Training:** indicates the typical on-the-job training needed to attain competency in the skills needed in the occupation.