



C·O·E

CENTERS OF EXCELLENCE
FOR LABOR MARKET RESEARCH

LABOR MARKET ANALYSIS

FOR PROGRAM RECOMMENDATION

FORESTRY MANAGEMENT and REFORESTATION

IN THE FAR NORTH

Far North

Center of Excellence

MARCH 2022

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TABLE OF CONTENTS

Contents

Summary	3
Introduction	4
Occupational Demand	5
Wages.....	7
Job Postings.....	8
Occupations and Job Titles.....	8
Employers.....	9
Skills and Experience.....	10
Education and Training.....	12
Educational Supply.....	13
Community College Supply.....	13
Other Postsecondary Supply.....	14
Findings	15
Recommendations.....	17
Appendix A. Methodology and Sources	18

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SUMMARY

The Far North Center of Excellence for Labor Market Research prepared this report to provide a labor market analysis of educational supply and occupational demand for middle-skilled and high-skilled career pathways in the Far North subregion. This report aims to determine if demand in the local labor market is unmet by the supply from existing community college programs and other postsecondary training providers.

This report focuses on training that leads to jobs in middle-skilled occupations - that is, occupations that typically require education beyond a high school diploma but less than a bachelor's degree – as well as higher-skilled occupations that require a bachelor's degree. Lowered skilled occupations are rarely considered in this type of analysis due to the lessened barriers for entry-level work, such as no formal education requirements and no requirements for on-the-job training.

Key findings include:

- The Far North subregion held 3,102 forestry management jobs in 2020.
- Far North forestry management jobs are projected to increase by 2% over the next five years, adding 67 new jobs to the subregion by 2025. High-skilled jobs are anticipated to grow at a faster rate than middle-skill jobs, at 4.7% compared to 1.7% respectively.
- Over the next five years, forestry management occupations are projected to have 462 annual openings in the Far North subregion.
- Wage data shows that forestry management occupations earn approximately \$2 to \$67 above the subregion's living wage of \$12.74 per hour.
- Awards data analysis shows that Far North training providers conferred an average of 117 awards annually (32 certificates and associate degrees and 85 bachelor's or master's degrees) in forestry management training programs over the last three academic years.

Recommendations include:

- Based on a three-year average of annual awards in the Far North region related to forestry management training programs and projected yearly openings, the supply gap analysis shows that the region seems to have room for additional training for both middle-skill and high-skill occupations.
- The Far North Center of Excellence recommends moving forward with exploration of the program.

INTRODUCTION

The Far North Center of Excellence (COE) was asked to provide labor market information for a proposed program at a regional community college. This report focuses on the following Standard Occupational Classification (SOC) occupations and codes:

- These middle-skill occupations require more education and training beyond a high school diploma but less than a four-year degree:
 - Forest and Conservation Technicians (19-4071)
 - First-Line Supervisors of Farming, Fishing, and Forestry Workers (45-1011)
 - Agricultural Inspectors (45-2011)
- These higher-skill occupations require a bachelor's degree:
 - Natural Sciences Managers (11-9121)
 - Conservation Scientists (19-1031)
 - Foresters (19-1032)

A review of related programs revealed the following Taxonomy of Programs (TOP) title(s) and code(s) are appropriate for inclusion in this report:

- Forestry (0114.00)
- Natural Resources (0115.00)
- Parks and Outdoor Recreation (0115.10)

The corresponding Classification of Instructional Program (CIP) title(s) and code(s) are:

- Natural Resources/Conservation, General (03.0101)
- Natural Resources Management and Policy, Other (03.0299)
- Forestry, General (03.0501)

OCCUPATIONAL DEMAND

Exhibit 1 summarizes the five-year projected job growth for middle-skill and high-skill occupations in the Far North, North/Far North, and California.

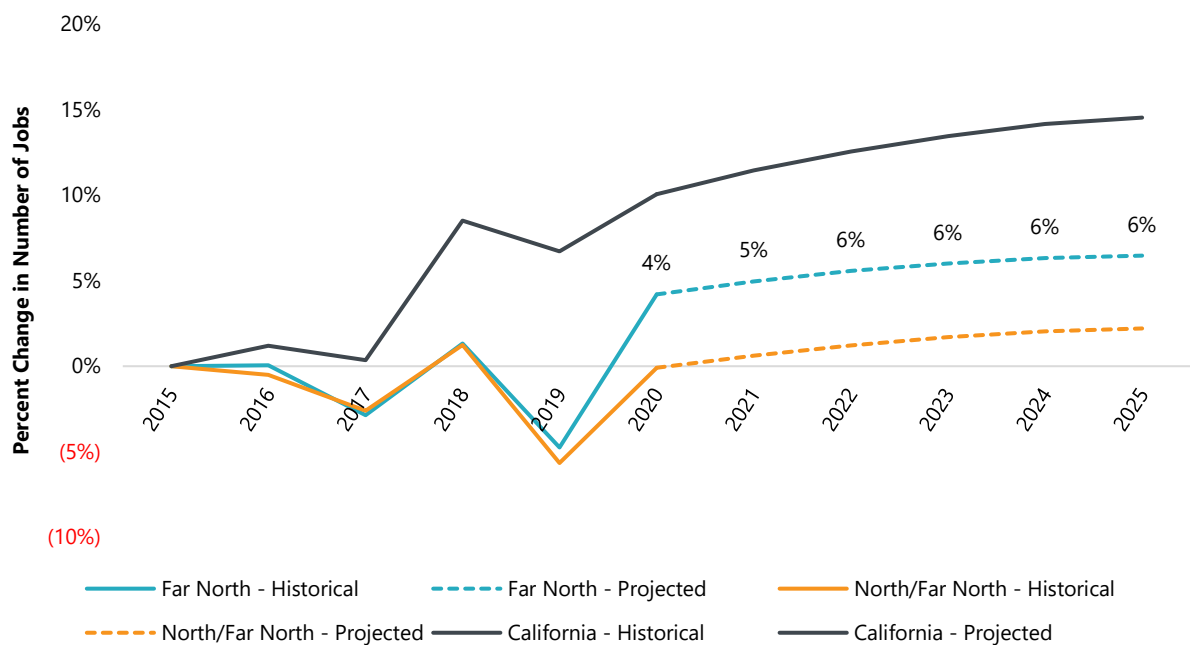
Exhibit 1. Employment and projected demand, 2020-2025

Occupation	2020 Jobs	2025 Jobs	2020-2025 Jobs Change	2020-2025 Jobs % Change	2020-2025 Annual Openings
Forest and Conservation Technicians	1,723	1,719	(5)	(0%)	236
First-Line Supervisors of Farming, Fishing, and Forestry Workers	747	794	47	6%	135
Agricultural Inspectors	189	194	4	2%	36
Natural Sciences Managers	79	88	9	11%	10
Conservation Scientists	178	186	8	4%	22
Foresters	185	189	4	2%	24
Far North	3,102	3,169	67	2%	462
Forest and Conservation Technicians	2,426	2,431	5	0%	335
First-Line Supervisors of Farming, Fishing, and Forestry Workers	1,210	1,271	61	5%	218
Agricultural Inspectors	414	421	7	2%	75
Natural Sciences Managers	627	649	22	4%	57
Conservation Scientists	331	347	16	5%	45
Foresters	261	270	9	3%	34
North/Far North	5,269	5,390	121	2%	764
Forest and Conservation Technicians	6,943	7,033	91	1%	1,105
First-Line Supervisors of Farming, Fishing, and Forestry Workers	12,502	12,988	486	4%	2,197
Agricultural Inspectors	2,467	2,527	61	2%	451

Occupation	2020 Jobs	2025 Jobs	2020-2025 Jobs Change	2020-2025 Jobs % Change	2020-2025 Annual Openings
Natural Sciences Managers	12,055	12,700	645	5%	1,282
Conservation Scientists	1,640	1,787	147	9%	231
Foresters	994	1,054	60	6%	143
California	36,601	38,090	1,489	4%	5,408

Exhibit 2 compares the percent change in jobs between 2015 through 2020 and the projected changes through 2025. The rate of change is indexed to the total number of jobs in 2015.

Exhibit 2. Changes in employment, 2015-2025



WAGES

Exhibit 3 compares the entry-level, median, and experienced wages for the selected occupations to the Far North living wage for a single adult – \$12.74 per hour.¹

Exhibit 3. Comparison of wages by occupation, 2020

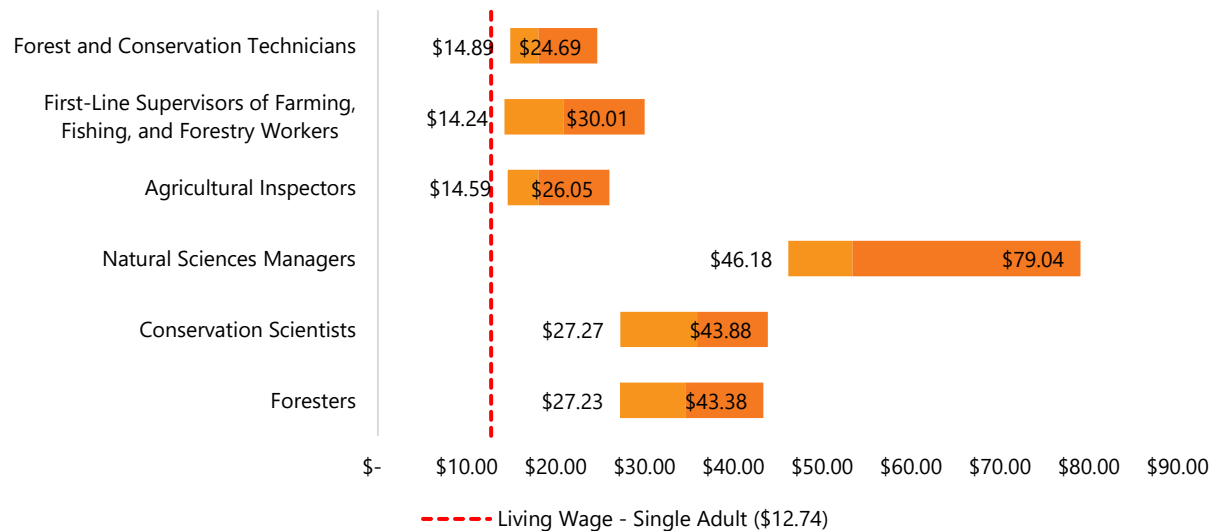
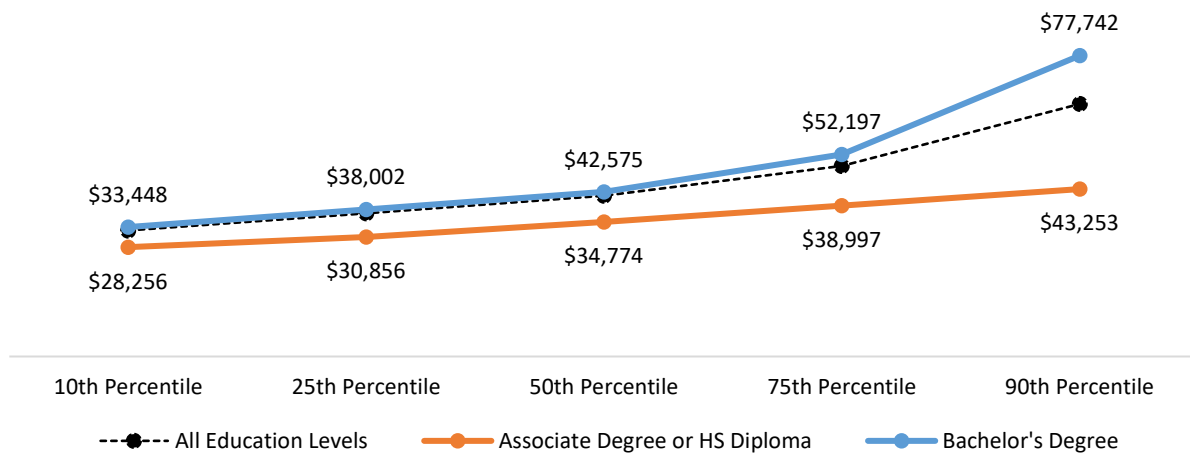


Exhibit 4 displays the market salary percentiles for the occupations in this report by education level.² The median salary for these occupations is \$42,575 annually for positions that require a bachelor's degree. For occupations requiring an associate's degree or high school diploma, the median salary is \$34,774, a \$7,801 difference.

¹ Living wage is defined as the level of income a single adult with no children must earn to meet basic needs, including food, housing, transportation, healthcare, taxes, and other miscellaneous basic needs. The 25th-percentile and 75th-percentile hourly wages are used as proxy for entry-level and experienced-level wages.

² Market Salary is calculated using a machine learning model built off of millions of job postings every year, and accounting for adjustments based on locations, industry, skills, experience, education requirements, among other variables.

Exhibit 4. Market salary percentiles for forestry management occupations by education level



JOB POSTINGS

This section of the report analyzes recent data from online job postings (real-time LMI). Online job postings may provide additional insight into recent changes in the labor market that are not captured by historical trends.

The Far North COE identified 371 online job postings for the selected occupations in the Far North subregion. Job postings data comes from Burning Glass Labor Insights and represents new listings posted online within the last year, from March 1, 2021, to February 28, 2022.

Occupations and Job Titles

Exhibit 5 details the number of online job postings for the selected occupations.

Exhibit 5. Number of job postings by occupation

Occupation	Job Postings	Share of Job Postings
Forest and Conservation Technicians	147	40%
First-Line Supervisors of Farming, Fishing, and Forestry Workers	18	5%
Agricultural Inspectors	3	1%
Natural Sciences Managers	54	15%
Conservation Scientists	35	9%

Occupation	Job Postings	Share of Job Postings
Foresters	114	31%
Total Job Postings	371	100%

Exhibit 6 shows the top 10 job titles with the most job postings and the share of job postings. All job postings included a job title.

Exhibit 6. Top jobs titles

Job Title	Job Postings	Share of Job Postings
Consulting Utility Forester	46	12%
Fire Engine Operator	18	5%
Forestry Technician	18	5%
Forester	15	4%
Forestry Technician Recreation	9	2%
Park Ranger	8	2%
Forestry Technician Sale Administration	7	2%
Forestry Technician Fire Dispatch	6	2%
Mrc - Forest Inventory Cruiser	5	1%
Rangeland Management Specialist	5	1%

Employers

Exhibit 7 shows the top 10 employers with the most job postings for the selected occupations. Twelve percent (n = 46) of job postings did not include an employer.

Exhibit 7. Employers with the most job postings

Employer	Job Postings	Share of Job Postings
Forest Service	81	25%
Bureau of Land Management	32	10%

Employer	Job Postings	Share of Job Postings
Cn Utility Consulting	30	9%
US Department of Agriculture	19	6%
Mendocino Redwood Company LLC	15	5%
AbbVie	14	4%
National Park Service	12	4%
Acrt Incorporated	10	3%
Mendocino Forest Products	7	2%
Wright Group	6	2%

Skills and Experience

Exhibit 8 shows the specialized skills most requested by employers for the selected occupations.

Exhibit 8. Most in-demand specialized skills

Specialized Skill	Skill Postings	Share of Skill Postings
Personnel Management	106	4%
Scheduling	91	3%
Fire Suppression	75	3%
Range Management	73	3%
Land Management	67	2%
Data Collection	66	2%
Budgeting	60	2%
Natural Resources	59	2%
Biology	48	2%
Customer Service	45	2%

To gauge employer preference for candidates with a bachelor's degree, Exhibit 9 shows the

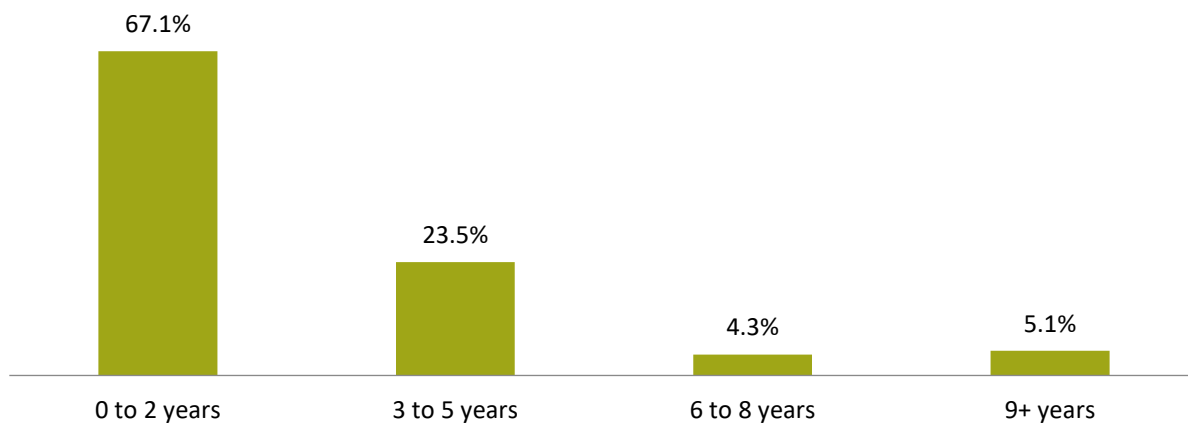
minimum level of education required by employers for job postings for the selected occupations since 2016. Bachelor's degree is listed as the minimum education requirement for these occupations in about one-third of postings, ranging from 28% in 2016 to 34% in 2021.

Exhibit 9. Employer-preferred minimum education levels

Minimum Education Level	2016	2017	2018	2019	2020	2021
High School or Vocational Training	39%	26%	18%	21%	23%	11%
Associate degree	5%	7%	10%	4%	4%	3%
Bachelor's degree	28%	29%	29%	27%	28%	34%
Master's degree	4%	6%	9%	9%	9%	11%
Doctoral degree	0%	0%	1%	2%	0%	1%
Unspecified	24%	33%	34%	38%	36%	41%

Exhibit 10 shows the experience levels required by employers for job postings for the selected occupations. Thirty-one percent (n = 116) of job postings did not include a preferred education level.

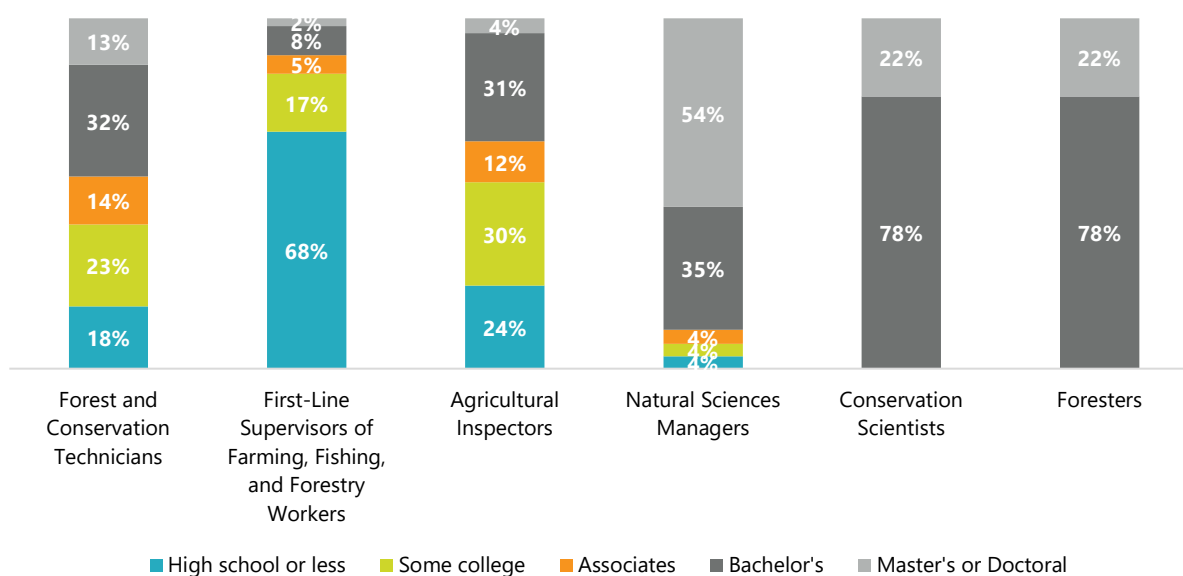
Exhibit 10. Employer-preferred experience levels



EDUCATION AND TRAINING

The U.S. Census Bureau and Bureau of Labor Statistics collects data on education achieved by workers employed in occupations. Exhibit 11 shows the national-level educational attainment of the current workforce in the selected occupations.

Exhibit 11. National worker educational attainment for selected occupations, 2019



The Bureau of Labor Statistics (BLS) uses a system to assign categories for entry-level education, work experience in a related occupation, and typical on-the-job training to each occupation for which the BLS publishes projections data. Exhibit 12 shows the skill level and entry-level job requirements for the selected occupations.

Exhibit 12. Typical education, work experience, and on-the-job training requirements

Occupation	Typical Entry-level Education	Work Experience Required	On-the-job Training Required
Forest and Conservation Technicians	Associate's degree	None	None
First-Line Supervisors of Farming, Fishing, and Forestry Workers	High school diploma or equivalent	Less than 5 years	None
Agricultural Inspectors	Bachelor's degree	None	Moderate-term on-the-job training
Natural Sciences Managers	Bachelor's degree	5 years or more	None
Conservation Scientists	Bachelor's degree	None	None
Foresters	Bachelor's degree	None	None

EDUCATIONAL SUPPLY

Educational supply for an occupation can be estimated by analyzing the number of awards issued in related Taxonomy of Programs (TOP) or Classification of Instructional Programs (CIP) codes. Exhibit 13 shows the TOP and CIP codes for educational programs related to the selected occupations.

Exhibit 13. TOP and CIP codes for training programs related to the selected occupations

TOP Programs and Codes	Aligned CIP Programs and Codes
Forestry (0114.00)	Natural Resources/Conservation, General (03.0101)
Natural Resources (0115.00)	Natural Resources Management and Policy, Other (03.0299)
Parks and Outdoor Recreation (0115.10)	Forestry, General (03.0501)

Community College Supply

Exhibits 14 displays the average number of certificates and degrees conferred in selected community college programs over the last three academic years.

Exhibit 14. Annual average community college awards by program, 2017-18 through 2019-20

Program - TOP Code	College	Annual Awards 2017-18	Annual Awards 2018-19	Annual Awards 2019-20	3-Yr Annual Awards Average
Forestry (0114.00)	Redwoods	7	1	4	4
	Shasta	2	0	3	2
	Subtotal	9	1	7	6
Natural Resources (0115.00)	Butte	7	16	13	12
	Shasta	3	13	3	6
	Subtotal	10	29	16	18
Parks and Outdoor Recreation (0115.10)	Butte	8	7	9	8

Program - TOP Code	College	Annual Awards 2017-18	Annual Awards 2018-19	Annual Awards 2019-20	3-Yr Annual Awards Average
	Subtotal	8	7	9	8
	Grand Total	26	37	32	32

Other Postsecondary Supply

Exhibit 15 compares the average number of degrees conferred by non-community college training providers in the Far North over the last three academic years. Please note that non-community college data lags by one year.

Exhibit 15. Other postsecondary awards by program, 2016-17 through 2018-19

Program - CIP Code	College	Annual Awards 2016-17	Annual Awards 2017-18	Annual Awards 2018-19	3-Yr Annual Awards Average
Natural Resources/ Conservation, General (03.0101)	Humboldt State University (Master's)	24	20	26	23
	Subtotal	24	20	26	23
Natural Resources Management and Policy, Other (03.0299)	Humboldt State University (Bachelor's)	41	20	3	21
	Subtotal	41	20	3	21
Forestry, General (03.0501)	Humboldt State University (Bachelor's)	38	40	42	40
	Subtotal	38	40	42	40
	Grand Total	103	80	71	85

FINDINGS

This report focuses on six occupations with relevant career pathways in forestry management. This included two occupations that typically lead to middle-skill occupations and four that lead to high-skill occupations.

- The Far North subregion held 3,102 forestry management jobs in 2020. About 86% of jobs were in middle-skilled technician and supervisory roles while another 14% were held in high-skilled forester and scientist jobs.
- Far North forestry management jobs are projected to increase by 2% over the next five years, adding 67 new jobs to the subregion by 2025. High-skilled jobs are anticipated to grow at a faster rate than middle-skill jobs, at 4.7% compared to 1.7% respectively.
- Over the next five years, forestry management occupations are projected to have 462 annual openings in the Far North subregion, with 88% of these openings in middle-skill occupations and 12% in higher-skill occupations.
- Wage data shows that forestry management occupations earn approximately \$2 to \$67 above the subregion's living wage of \$12.74 per hour. Entry-level wages for middle-skill occupations are between \$14-15 per hour while entry-level wages for high-skill occupations are between \$27-46 per hour.
- According to real-time labor market information, there were 371 online job postings for forestry management occupations between March 1, 2021, to February 28, 2022. Forty-five percent (n = 168) of job postings were for middle-skill occupations, while 55% of job postings (n = 203) were for high-skill occupations.
- While almost 40% of the job postings did not specify a preferred minimum education level, 23% of the online job postings required, at most, an associate's degree. Another 53% of job postings required a bachelor's degree.
- In 2020, between 22% and 42% of incumbent middle-skilled workers had an education level consistent with community college offerings (some college or an associate degree). Up to 32% of incumbent workers in these occupations held a bachelor's degree.
- Most incumbent workers in the high-skilled forestry management occupations (foresters and scientists) have a bachelor's degree or beyond. In 2020, 35-78% of workers in these roles held a bachelor's degree, while most of the remaining workers held graduate and professional degrees.
- Three Far North community colleges offer degrees and certificates in programs related to forestry management. Together, these programs conferred an average of 32 awards (certificates and associate degrees) in forestry and natural resource programs over the last three academic years (2017-18 through 2019-20).

- One local non-community college postsecondary institution (Humboldt State University) offered bachelor's and master's programs related to the studied occupations. Between 2016-17 and 2018-19, Humboldt State conferred an average of 85 awards in forestry and natural resource programs over the last three years. Please note that non-community college awards data lags by one year.

RECOMMENDATIONS

- Based on a three-year average of annual awards in Far North region forestry management training programs and projected yearly openings, the supply gap analysis shows that the region seems to have room for additional training for both middle-skill and high-skill occupations.
 - Far North community colleges issued an average of 35 certificate or associates degrees over the last three years while other post-secondary institutions conferred an average of 42 bachelor's or master's degrees.
 - There are 462 projected annual openings for forestry management occupations, including 407 for middle-skill occupations and 56 for high-skill occupations.
 - Real time job posting data from Burning Glass indicates a need for high-skill workers in forest management, with 203 job postings during the last twelve month.
- The Far North Center of Excellence recommends moving forward with exploration of the program.

APPENDIX A. METHODOLOGY AND SOURCES

Occupations in this report were identified using the Center of Excellence TOP-to-CIP-to-SOC crosswalk and O*Net OnLine. This report's findings were determined using labor market data from the Bureau of Labor Statistics (BLS), U.S. Census Bureau data from Emsi, and jobs posting data from Burning Glass.

Cal-PASS Plus LaunchBoard. California Community Colleges Chancellor's Office.

<https://www.calpassplus.org/LaunchBoard/Home.aspx>.

Emsi. <https://www.economicmodeling.com/>. 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).

Educational Attainment for Workers 25 Years and Older by Detailed Occupation, 2016-2017. Bureau of Labor Statistics. <https://www.bls.gov/emp/tables/educational-attainment.htm#>.

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"Taxonomy of Programs." California Community Colleges Chancellor's Office. June 2012, 6th Edition. <https://www.cccco.edu/-/media/CCCCO-Website/About-Us/Divisions/Educational-Services-and-Support/Academic-Affairs/What-we-do/Curriculum-and-Instruction-Unit/Files/TOPmanual6200909corrected12513pdf.ashx>

"TOP-CIP-SOC Crosswalk." Centers of Excellence for Labor Market Research. November 2015 Edition. <http://coeccc.net/>

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.

Important Disclaimer: All representations included in this report have been produced from primary research and/or secondary review of publicly and/or privately available data and/or research reports. Efforts have been made to qualify and validate the accuracy of the data and the reported findings; however, neither the Centers of Excellence, COE host District, nor California Community Colleges Chancellor's Office are responsible for applications or decisions made by recipient community colleges or their representatives based upon components or recommendations contained in this study.

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Centers of Excellence for Labor Market Research, Economic and
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