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CENTERS OF EXCELLENCE
FOR LABOR MARKET RESEARCH

PROGRAM ENDORSEMENT BRIEF

FORESTRY MANAGEMENT IN THE GREATER SACRAMENTO REGION

North (Greater Sacramento)
Center of Excellence

MAY 2021

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SUMMARY

The North/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 career pathways in the North (Greater Sacramento) subregion. This report aims to determine if occupational demand in the local labor market is being met by the supply from existing community college programs and other postsecondary training providers.

This report primarily 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. This report may also include higher-skilled occupations for training pathways that lead to a bachelor's degree. Low-skilled occupations are rarely considered in this type of analysis due to fewer educational barriers for entry-level work, such as no formal education requirements and fewer requirements for work experience and on-the-job training.

Key findings include:

- The North (Greater Sacramento) region held about 1,700 forestry management jobs in 2019. Jobs are projected to increase by 2% over the next five years, adding about 37 new jobs to the local area.
- Over the next five years, forestry management occupations are projected to have more than 200 annual openings in the North (Greater Sacramento) region. Most job openings (76%) will be for middle- and high-skilled occupations.
- Wage data shows that middle- and high-skilled forestry management occupations earn \$1 to \$22 above the subregion's living wage of \$13.18 per hour.
- Recent online job postings are almost evenly split between middle- and high-skilled occupations, suggesting a local need for workers with a minimum of a community college education.
- Awards data analysis shows that North (Greater Sacramento) community colleges conferred an average of 35 awards in forestry management programs over the last three academic years. Local four-year institutions granted an average of 59 bachelor degrees per year between 2016-17 and 2018-19.

INTRODUCTION

The North (Greater Sacramento) Center of Excellence 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:

- Conservation Scientists (19-1031)
- Foresters (19-1032)
- Forest and Conservation Technicians (19-4071)
- First-Line Supervisors of Farming, Fishing, and Forestry Workers (45-1011)
- Forest and Conservation Workers (45-4011)

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

- Forestry (0114.00)
- Natural Resources (0115.00)

The corresponding Classification of Instructional Programs (CIP) code(s) are:

- Natural Resources/Conservation, General (03.0101)
- Forestry, General (03.0501)

OCCUPATIONAL DEMAND

Exhibit 1 summarizes the five-year projected job growth for middle-skill* and high-skill** occupations in the North (Greater Sacramento) subregion, North/Far North, and California.

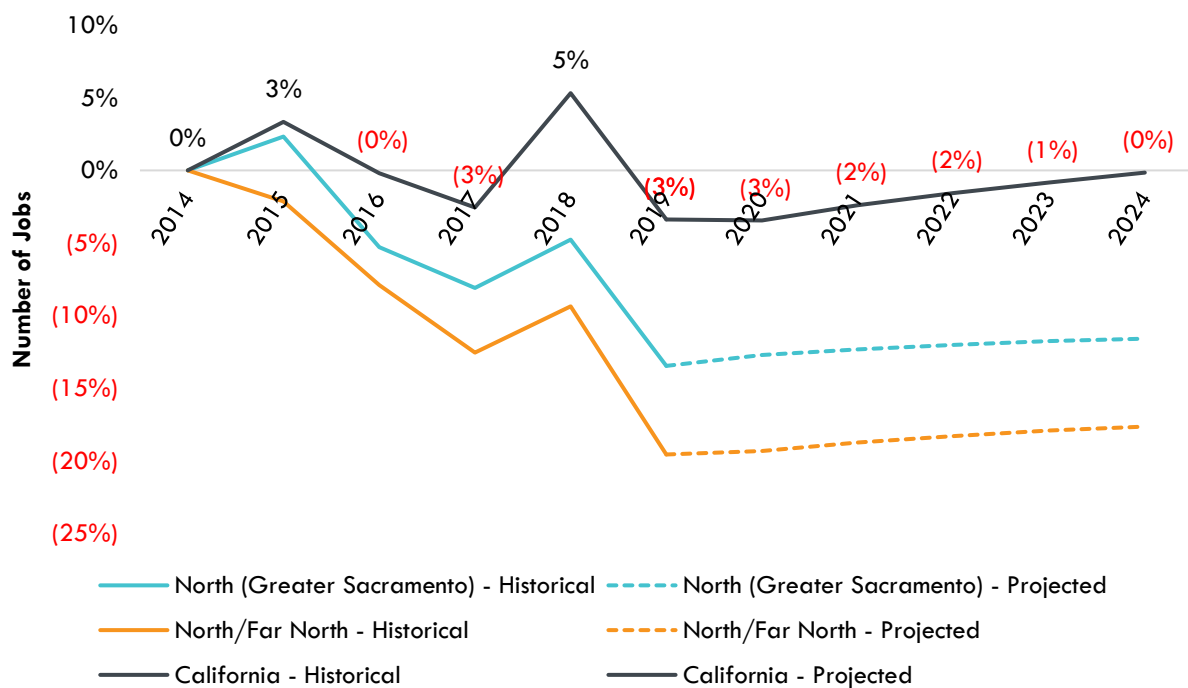
Exhibit 1. Occupational employment and projected demand, 2019-2024

Occupation	2019 Jobs	2024 Jobs	2019-2024 Jobs Change	2019-2024 Jobs % Change	2019-2024 Annual Openings
Conservation Scientists**	285	296	11	4%	27
Foresters**	94	99	5	6%	10
Forest and Conservation Technicians*	522	533	11	2%	60
First-Line Supervisors of Farming, Fishing, and Forestry Workers*	454	464	10	2%	64
Forest and Conservation Workers	344	343	(1)	(0%)	51
North (Greater Sacramento)	1,699	1,735	37	2%	212
Conservation Scientists**	504	528	23	5%	49
Foresters**	254	258	4	2%	25
Forest and Conservation Technicians*	1,548	1,567	19	1%	179
First-Line Supervisors of Farming, Fishing, and Forestry Workers*	1,197	1,247	50	4%	175
Forest and Conservation Workers	1,074	1,087	13	1%	161
North/Far North	4,577	4,686	109	2%	588
Conservation Scientists**	2,061	2,214	153	7%	214
Foresters**	960	1,010	50	5%	98
Forest and Conservation Technicians*	4,425	4,510	85	2%	514

Occupation	2019 Jobs	2024 Jobs	2019-2024 Jobs Change	2019-2024 Jobs % Change	2019-2024 Annual Openings
First-Line Supervisors of Farming, Fishing, and Forestry Workers*	12,858	13,225	368	3%	1,829
Forest and Conservation Workers	2,872	2,989	116	4%	442
California	23,176	23,948	772	3%	3,097

Exhibit 2 compares the percent change in jobs between 2014 through 2019 and the projected changes through 2024. The rate of change is indexed to the total number of jobs in 2014.

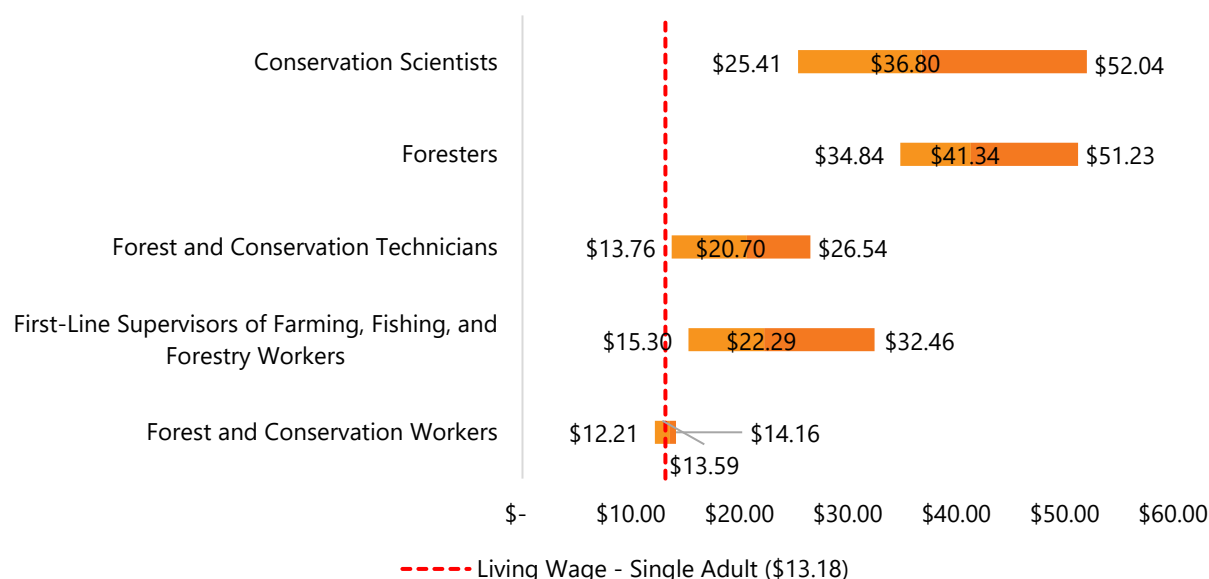
Exhibit 2. Changes in occupational employment, 2014-2024



WAGES

Exhibit 3 compares the entry-level, median, and experienced wages for the selected occupations to the North (Greater Sacramento) living wage for a single adult - \$13.18 per hour.¹

Exhibit 3. Comparison of wages by occupation, 2019



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 and projected trends.

The NFN COE identified 283 new online job postings for the selected occupations in the North (Greater Sacramento) region. Job postings data comes from Burning Glass Labor Insights and represents new listings posted online within the last year, from May 1, 2020, to April 30, 2021.

Occupations and Job Titles

Exhibit 4 details the number of online job postings for the selected occupations. All job postings were aligned to an occupation. Occupations marked with asterisks are considered middle-skilled

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.

(*) or high-skilled (**).

Exhibit 4. Number of job postings by occupation

Occupation	Job Postings	Share of Job Postings
Forest and Conservation Technicians*	105	37%
Foresters**	94	33%
Conservation Scientists**	57	20%
First-Line Supervisors of Farming, Fishing, and Forestry Workers*	20	7%
Forest and Conservation Workers	7	2%
Total Job Postings	283	100%

Exhibit 5 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 5. Top jobs titles

Job Title	Job Postings	Share of Job Postings
Consulting Utility Forester	46	16%
Utility Forester	16	6%
Forestry Technician	13	5%
Forester	9	3%
Forest Patrol	8	3%
Transmission Forester	7	2%
Supervised Visitation Monitor	4	1%
Conservationist I	4	1%
Revegetation Technician - Seasonal	3	1%
Planning Technician	3	1%

Employers

Exhibit 6 shows the top 10 employers with the most job postings for the selected occupations. Thirteen percent (n = 36) of job postings did not include an employer.

Exhibit 6. Employers with the most job postings

Employer	Job Postings	Share of Job Postings
Forest Service	40	14%
ACRT Pacific, LLC.	28	10%
US Department of Agriculture	22	8%
CN Utility Consulting (CNUC)	14	5%
The Great Basin Institute	8	3%
Utilities Service	7	2%
US Department of the Interior	6	2%
Sierra Pacific Industries	5	2%
ECI Environmental Consultants	5	2%
Bureau of Land Management	5	2%

Certifications, Skills, and Experience

Exhibit 7 shows the most relevant certifications requested by employers for the selected occupations. Forty percent (n = 114) of job postings did not include certification requirements.

Exhibit 7. Most in-demand certifications

Certification	Job Postings	Share of Job Postings
Wildland Firefighter I	18	6%
Certified Arborist	16	6%
Hazardous Materials Certification	7	2%
Project Management Professional (PMP)	2	0.7%
Certified Forester	1	0.3%

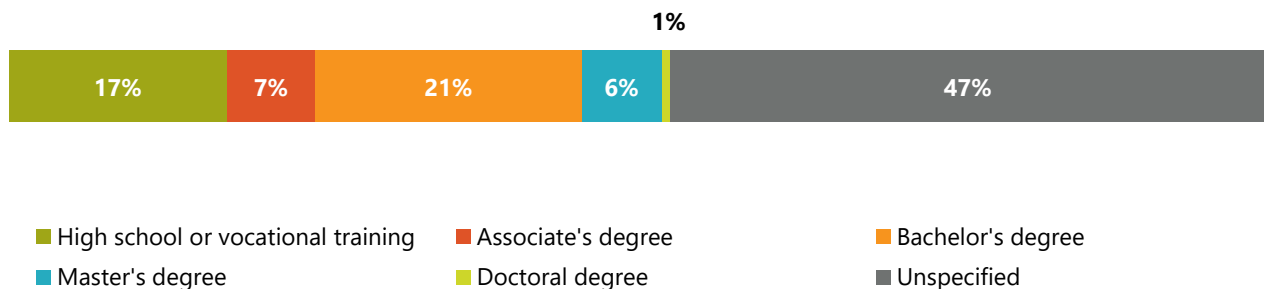
Exhibit 8 shows the specialized skills most requested by employers for the selected occupations.

Exhibit 8. Most in-demand specialized skills

Specialized Skill	Job Postings	Share of Job Postings
Natural Resources	63	22%
Personnel Management	61	22%
Biology	56	20%
Scheduling	54	19%
Data Collection	47	17%
Natural Resource Management	43	15%
Range Management	43	15%
Environmental Studies	42	15%
Global Positioning System (GPS)	40	14%
Environmental Science	38	13%

Exhibit 9 shows the minimum level of education required by employers for job postings for the selected occupations. Forty-seven percent of job postings did not include a preferred education level.

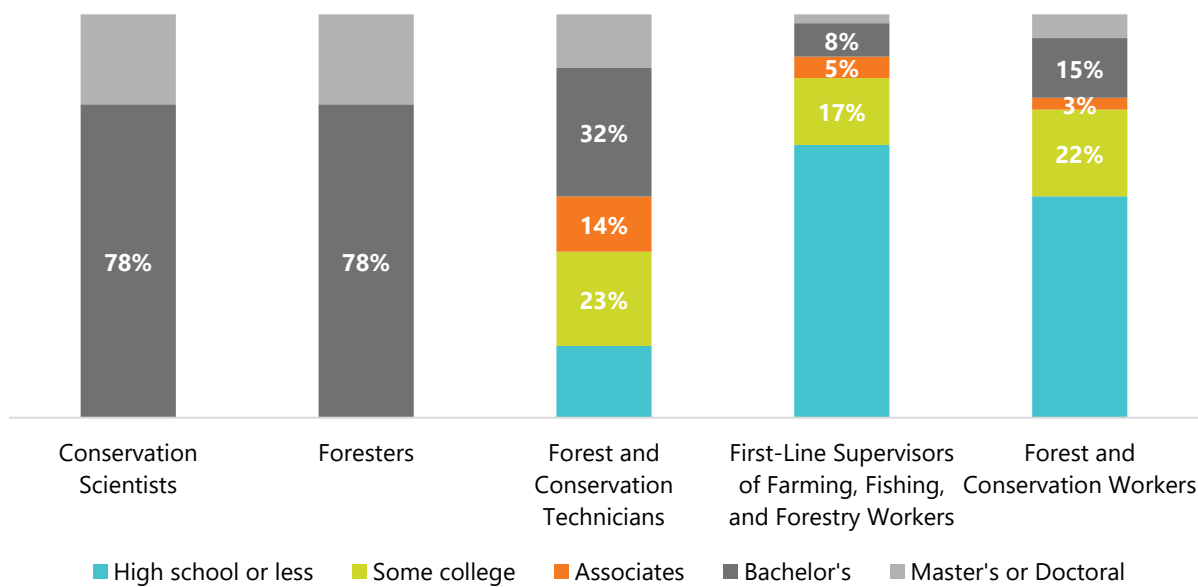
Exhibit 9. Employer-preferred minimum education levels



EDUCATION AND TRAINING

The U.S. Census Bureau and Bureau of Labor Statistics collected data on education achieved by workers employed in occupations. Exhibit 10 shows the national-level educational attainment of the current workforce in the selected occupations.

Exhibit 10. 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 on each occupation for which the BLS publishes projections data. Exhibit 11 shows the entry-level job requirements for the selected occupations. Occupations marked with asterisks are considered middle-skilled (*) or high-skilled (**).

Exhibit 11. Typical education, work experience, and on-the-job training requirements

Occupation	Typical Entry-level Education	Work Experience Required	On-the-job Training Required
Conservation Scientists**	Bachelor's degree	None	None
Foresters**	Bachelor's degree	None	None
Forest and Conservation Technicians*	Associate's degree	None	None
First-Line Supervisors of Farming, Fishing, and Forestry Workers*	High school diploma or	Less than five years	None

Occupation	Typical Entry-level Education	Work Experience Required	On-the-job Training Required
	equivalent		
Forest and Conservation Workers	High school diploma or equivalent	None	Moderate-term on-the-job training

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 12 shows the TOP and CIP codes for educational programs related to the selected occupations.

Exhibit 12. TOP and CIP codes for training programs related to the selected occupations

TOP Programs and Codes	Aligned CIP Programs and Codes
Forestry (0114.00)	Forestry, General (03.0501)
Natural Resources (0115.00)	Natural Resources/Conservation, General (03.0101)

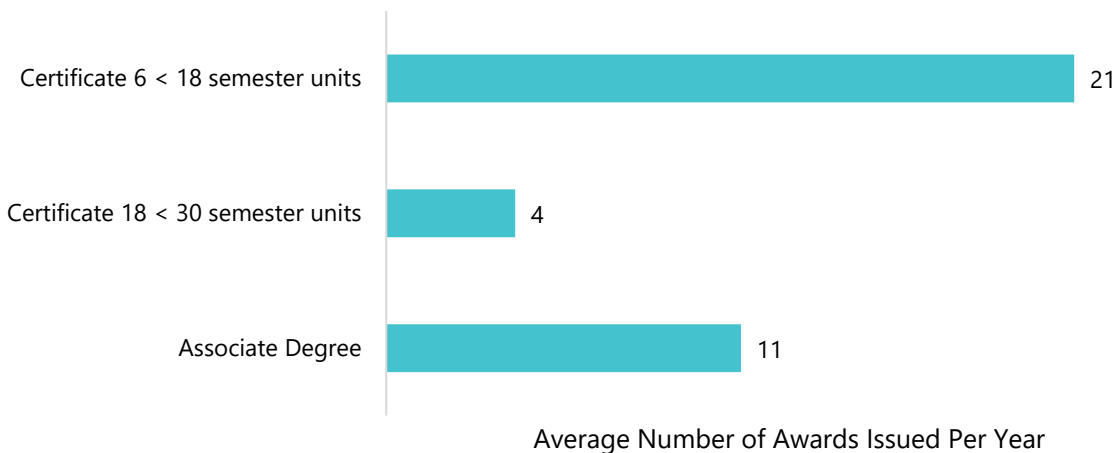
Community College Supply

Exhibits 13 and 14 compare the average number of certificates and degrees conferred in selected community college programs over the last three academic years.

Exhibit 13. 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	N/A	--	--	--	--
	Subtotal	--	--	--	--
Natural Resources - 0115.00	American River	44	33	28	35
	Subtotal	44	33	28	35
	Grand Total	44	33	28	35

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



Other Postsecondary Supply

Exhibit 15 compares the average number of degrees conferred by non-community college training providers in the North (Greater Sacramento) area 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	University of California, Davis	46	71	60	59
	Subtotal	46	71	60	59
	Grand Total	46	71	60	59

FINDINGS

- The North (Greater Sacramento) region held about 1,700 forestry management jobs in 2019. About 57% (n = 976) of these jobs were in middle-skilled technician and supervisor roles, while another 22% (n = 379) were held in high-skilled forester and scientist jobs. The remaining 20% of employment (n = 344) were in low-skilled jobs.
- North (Greater Sacramento) forestry management jobs are projected to increase by 2% over the next five years, adding about 37 new jobs to the subregion by 2024. Middle-skilled technician and supervisor positions are projected to add 21 new jobs by 2024, while the high-skilled forester and scientist jobs will add 16 new positions.
- Over the next five years, forestry management occupations are projected to have just over 200 annual openings in the North (Greater Sacramento) region. Nearly 60% (n = 124) of the projected openings are for middle-skilled positions. There are a projected 37 annual openings for high-skilled occupations.
- Wage data shows that forestry management occupations typically earn entry-level hourly wages above the subregion's living wage of \$13.18. Entry-level wages for middle-skilled technician and supervisor roles range from \$14 to \$15 per hour, while high-skilled forester and scientist roles earn between \$25 to \$35 per hour. Only one of the studied forest management occupations has entry-level wages below the area's living wage - forest and conversation workers at about \$12 per hour. (Please note that as of January 1, 2021, California's minimum wage is \$13-\$14 per hour. The wages reported here are based on 2019 wages).
- According to real-time labor market information, there were about 283 online job postings for the studied forestry management occupations between May 1, 2020, and

April 30, 2021. Online job postings were almost evenly split between middle-skilled and high-skilled occupations, at 44% and 53%, respectively. Only 2% of job postings were for the lower-skilled forested and conservation worker occupation.

- While almost half of the job postings did not specify a preferred minimum education level, 24% of the online job postings required, at most, an associate's degree. Another 21% of job postings required a bachelor's degree.
- In 2019, between 22% and 37% of incumbent middle-skilled forest technicians and supervisors 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 2019, 78% of workers in these roles held a bachelor's degree, while most remaining workers held graduate and professional degrees.
- American River College is the only North (Greater Sacramento) community college that offers degrees and certificates in a program related to forestry management.
- Analysis of awards data shows that American River conferred an annual average of 35 awards (certificates and associate degrees) in a forestry management program over the last three academic years, from 2017-2018 through 2019-2020.
- Local four-year universities also offer awards in programs related to forestry management. The University of California, Davis conferred an average of 59 bachelor's degrees per year between 2016-2017 and 2018-2019. Please note that non-community college awards data lags by one year.

RECOMMENDATIONS

- Based on a three-year average of annual awards in North (Greater Sacramento)subregion forestry management programs and projected yearly openings, the supply gap analysis shows that the region seems to have room for new training programs at the middle-skill level.
 - Community college programs issued an average of 35 awards over the last three years. There are 97 projected annual openings for related middle-skilled occupations (i.e., technician and supervisor jobs).
 - Forestry management programs at four-year universities issued an average of 59 bachelor degrees over the last three years. There are 37 projected annual openings for high-skilled forester and scientist jobs.
- While the gap analysis shows an oversupply of bachelor's degrees for a smaller share of high-skilled forestry management jobs, it is essential to note that the University of California, Davis is an internationally recognized and internationally attended university. There may be gaps in the local labor market unaccounted for in a simple occupational demand and educational supply analysis.
- The North/Far North Center of Excellence recommends that local community colleges proposing new forestry management programs work with industry partners and four-year universities to understand better the workforce needs for high-skilled forestry management jobs and a subsequent transfer pathway.
- The North/Far North Center of Excellence recommends moving forward with the program.

COE Recommendation		
Move forward with the program	Proceed with caution	Program is not recommended
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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#>.

Integrated Postsecondary Education Data System (IPEDS). National Center for Education Statistics. U.S. Department of Education. <https://nces.ed.gov/ipeds/>.

"Labor Insight Real-Time Labor Market Information Tool." Burning Glass Technologies.

<http://www.burning-glass.com>.

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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://coecccc.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
Workforce Development Program



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