

# Reedley College

## Natural Resources Associate in Science Degree

### Item 1. Program Goals and Objectives

The goal of this associate in science (A.S.) program is to provide occupational skill training for students seeking a career in the Career Technical Education (CTE) field of natural resources. Upon completion of this program, students will be able to:

- Communicate effectively, including use of proper presentation and interpretative techniques to the public and co-workers using diverse media.
- Utilize and apply digital/electronic technology and specialized software programs for forest mapping, inventorying, and communication.
- Demonstrate a breadth of knowledge of scientific, social, and political issues tied to forestry and the natural resources industry, providing a base for decision making and credibility in personal interactions and career decisions.
- Perform technical skills important for entry level positions in the natural resources field i.e. wildlife management, wildfire suppression and outdoor recreation/interpretation.
- Successfully secure and maintain seasonal employment in the natural resources field while demonstrating professional ethics.
- Describe scientific concepts and processes which affect the sustainability of natural resources.

#### Student Selection and Fees:

The Reedley College Forestry/Natural Resources Program is an open program with no entry criteria. There is a mandatory lab fee of \$15 for each of the Field Studies Courses i.e. (NR 108, 109, 110, 115, 116).

### Item 2. Catalog Description

The Associate in Science Degree in Natural Resources is designed to provide students with the knowledge, training, and hands-on experience necessary to pursue a career in Natural Resources. Students are exposed to the guiding principles and philosophies of natural resource management in the context of ecosystem management. Following completion of this program, students will have the specialized training and technical skills for entry-level positions that can lead to accelerated advancement into supervisory and/or management positions. Opportunities exist within private, state and federal agencies such as the California Department of Fish and Game, Cal Fire, U.S. Forest Service, and the U.S. Fish and Wildlife Service. Careers abound in the areas of fire suppression and management, outdoor recreation, interpretation, wildlife management, and watershed management.

### Item 3. Program Requirements

#### Natural Resources AS Degree

Requirements	Dept. Name/#	Name	Units	CSU-GE	IGETC	Sequence
Required Core – 28 units	NR 1	Introduction to Forestry	3			Yr 1, Fall
	NR 3	Computers in Natural Resources	1			Yr 2, Fall
	NR 4	Forest Ecosystems	3			Yr 1, Fall
	NR 6	Dendrology	3			Yr 1, Spring
	NR 8	Natural Resources Career Preparation	1			Yr 1, Fall
	NR 12	Watershed Ecology	3			Yr 2, Fall
	NR 14	Principles of Wildlife Management	3			Yr 1, Spring
	NR 18	Aerial Photo Interp. & Geographic Information Systems	3			Yr 2, Spring
	NR 19V	Cooperative Work Experience, Natural Resources	3			Yr 1, Summer Yr 2, Fall
	NR 20	Forest Measurements	3			Yr 2, Fall

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	NR 35	Interpretation of Natural Resources	3			Yr 2, Spring
Required Courses – select 2 units	NR 108	Introduction to Forestry Field Studies	0.5			Yr 1, Fall
	NR 109	Forestry Field Studies I	0.5			Yr 1, Fall
	NR 110	Forestry Field Studies II	0.5			Yr 1, Spring
	NR 115	Advanced Field Studies I	0.5			Yr 2, Fall
	NR 116	Advanced Field Studies II	0.5			Yr 2, Spring
Electives – select at least 10 units	NR 5	Wildland Fire Technology	3			Yr 1, Fall/Spring
	NR 11	Silviculture	3			Yr 2, Spring
	NR 21	Forest Products	3			Yr 1/2, Fall
	NR 30	Forest Recreation	3			Yr 1/2, Fall
	NR 31	Animal Packing	1			Yr 1/2, Fall
	NR 36	Natural Resources Law Enforcement	3			Yr 1/2, Spring
	NR 42	Advanced Wildland Fire Technology	2			Yr 1/2, Spring
	NR 91	Wilderness Navigation	1			Yr 1/2, Fall
	NR 90	Backpacking	1			Yr 1/2, Fall
	NR 92	Wilderness Survival	1			Yr 1/2, Spring

Required Major Total 40 units  
 Completion of CSU-GE Breadth or IGETC pattern 37-39 units  
 (Possible double counting: 12 units)  
 Transferable electives (as needed to reach 60 units)  
**TOTAL UNITS 60 units**

Proposed Sequence:  
 Year 1, Fall = 15 units  
 Year 1, Spring = 12 units  
 Year 1, Summer = 3 units  
 Year 2, Fall = 14 units  
 Year 2, Spring = 16 units  
**TOTAL UNITS: 60 units**

An excerpt from Reedley College Forestry/Natural Resources Program Advisory Committee Meeting, December 11, 2012 minutes is presented below expressing the need for two separate degrees: Forestry A.S. and Natural Resources A.S. (complete minutes submitted at end of proposal):

**Curriculum Change-** Kent Kinney reported that program needs to meet SAF (Society of American Foresters) accreditation and also state accreditation which is requiring more GE (general education). Presently the forestry/natural resource major degree is 73 units. Kent proposed the possibility of two separate degrees

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*Forestry and Natural Resources both 60 units. Forestry degree will include all SAF required classes and the NR degree will have classes tailored for other careers, such as firefighting or recreation. This curriculum change could take a few years to implement. Dr. Claudia Habib stated that the college is under fire because students are taking too long to receive a 2-year degree. She realized the need for 3<sup>rd</sup> instructor and that the taxpayers place importance on job placement. Kent stated his confidence in the administrators at Reedley College. Kent stressed the importance of students completing either a degree or certificate and that the fire discipline will help us gain amount of completers. Darcie Brown stated that NR 7 was her favorite class and that professional guest speakers can help fill gaps in class curriculums. John Exline (U.S. Forest Service) states that it is the right thing to split program into two degrees and stressed importance of SAF accreditation. Kent Kinney reported that the State Chancellor has stated that all AGNR programs will emphasize water, environment and agriculture.*

#### **Item 4. Master Planning**

This Natural Resources Associate in Science degree is in agreement with the Reedley College Mission's and State Center Community College District Master Plan's Goal 4 of Economic and Workforce Development by offering access to quality career technical programs.

The Forestry and Natural Resources Program participates in a regular program review process. The prior program review submitted Fall 2011 mentioned a recommendation for the creation of natural resources degree by program advisory committee. The present program review document, to be submitted in Fall 2015, discusses that we are in process of splitting the degree program into two separate Associate of Science degrees; AS in Forestry and AS in Natural Resources, thus reducing the number of units required to complete the program to the standard 60 units as opposed to the current 75 units. These new degrees having this reduction of units will enable a greater number of students to become program completers and become employable in the field of forestry and natural resources.

In addition to utilizing the program review process for program improvement, the Forestry and Natural Resources Program meets twice annually with an industry-based advisory committee to discuss industry/workplace needs and the enhancement of instructional programs to facilitate those needs. Discussions often focus on specific skill sets desired by employers as well as current industry trends and issues with which students must be familiar upon program completion. This advisory committee recommended splitting the program into two separate degrees see (Section 3) and attached are the minutes from advisory committee meetings reflecting discussion items and recommendations for program improvement.

#### **Library and Learning Resources Plan:**

The Forestry and Natural Resources students have access to Reedley College's library and learning resource center. The library houses over 38,000 volumes and is organized according to the Library of Congress classification system. Bibliographic information can be accessed through the Horizon Online Catalog. The library also subscribes to over 70 print periodicals and 7 local and national newspapers. Thirty-six of these periodicals deal with forestry and related topics. Formats available are hard copy and full text online.

In the library there are computers to use for reference and research and an open computer lab with 85 computers. Photocopying and microfilm readers are also offered to students. Two conference rooms are

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available for students to use in groups. Library and computer lab staff are available all open hours for assistance.

Additionally the Forestry and Natural Resources Program has 407 square feet – Forest Library & Conference room located in the Forestry Engineering Math (FEM) building. Used for college-wide meetings, forestry student study sessions, club meetings, and storage of various Forestry and Natural Resources journals, books and taxidermy collection.

#### Facilities and Equipment Plan:

The Reedley College campus is situated on 110.8 acres with an adjacent 300-acre school farm. Facilities directly assigned to the Forestry Program are as follows:

A 2-acre clonal eucalyptus block developed in conjunction with the Eucalyptus Improvement Association. This area is used for tree measurements, ecological field studies, silvicultural practices, and chainsaw instruction.

A substantial amount of riparian acreage adjacent to the Kings River is also utilized by the Program. This area is used for dendrology instruction, wildlife instruction, watershed instruction, and trail construction. Included within this area is a horse trail developed and maintained by Forestry Program faculty & students. A Reedley College River Ranger program has recently been established with support of funding from the Kenneth Martin Family Trust and the Fresno Regional Foundation. This provides employment of students to perform public contact and habitat restoration. The River Ranger employment is a permanently-funded, endowed program which is directed by the Reedley College Natural Resources Program staff.

A four-acre grove of valley oak trees (*Quercus lobata*). This area is used for forest ecosystem instruction, wild fire instruction, wildlife instruction, dendrology, vegetation classification, silviculture, and individual projects.

Forestry Program Compound – This area is used as a wood storage facility for the Forestry Club, equipment storage for animal packing class, and hazardous materials (e.g. chainsaw oil, fuel, and paint) in OSHA approved containers. Additionally, this area is being used for outdoor instruction and maintenance of tools, chainsaws, and the Portable Mobile Dimension Sawmill. A minimum ½ acre lot is essential to the Program.

The following classrooms and shop areas are assigned to the Reedley College Forestry Program. In the past 20 years, due to increased student numbers campus wide, classes from other program areas have been assigned to instruct courses in these facilities, when not in use by the Forestry and Natural Resources Program.

- i. FEM 6 – 680 square feet – Tool Room & Storage area. This area is primarily used for storage of laboratory and instructional materials. Currently, the area is used for equipment maintenance and for laboratory preparation. The FEM Forestry tool room has been improved by moving chainsaws out and allowing for student space and better storage of hand tools
- ii. FEM 6A – 144 square feet – Walk-in refrigerator for plant samples.
- iii. FEM 7 – 1221 square feet of classroom space and a dry lab. Mostly used for lecture or measurement & surveying labs. This is also where the wood and map collection is housed.

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Additionally, 24 Dell wireless laptop computer workstations and 4 stationary workstations are available for student use. This room was originally designated as a forest mensuration laboratory but is now primarily used as a lecture room by the English Department.

- iv. FEM 8 – 1800 square feet of wet lab. Used for Forest Ecosystems, Dendrology, Wildlife Management, Conservation of Natural Resources, Wildland fire, and Taxidermy. This is where the plant, pine cone, and wildlife collections are housed. Also used for lecturing, particularly by other departments.
- v. FEM 9 – 407 square feet – Forest Library & Conference room. Used for college-wide meetings, forestry student studies, and storage of various Forestry and Natural Resources journals, books and taxidermy collection.
- vi. FEM 10 – 204 square feet – Faculty Office houses one forestry instructor/ Dept.Chair.
- vii. FEM 11 – 180 square feet – Forestry surveying storage
- viii. FEM 12 – 938 square feet computer lab with 36 desktop computers and 1 instructor computer. The room also houses a large format printer (a.k.a. plotter).
- ix. LSH 3 Environmental Horticulture Shop and storage building has recently been partially assigned to the Forestry Program. Forestry has equipped the shop with steel tables with vises attached. Equipment within this building includes stationary wood saws and shapers and an air exhaust system. This facility provides for student and laboratory use related to forest products and tool skills development in NR1, NR5, NR21, and NR 133.
- x. LSH Storage Building – This non-student-accessible building is uninsulated and has no electrical or lighting installed. It houses repair parts, OHV vehicles, and motorized portable equipment. A chainsaw storage cage has been built inside the storage building in which all chainsaws are stored
- xi. Fuel and oil storage cabinets are located in a wooden shed on the southwest exterior of LSH 3.
- xii. One 8 by 40 foot Conex and two 8 by 10 foot Conex, steel containers are used to store fire hand tools, and other department inventory.

Reedley College Forest at Sequoia Lake - The Sequoia Lake Conference of YMCAs provides an 818 acre forest at Sequoia Lake for use by the Reedley College Forestry Program. The agreement calls for the instructional use and management of the Sequoia Lake property by Reedley College faculty, staff, and students. The Sequoia Lake property contains a 77 acre lake, residential cabins, and cafeteria facilities all available for Reedley College use. The forest is located at 5,500 feet elevation, roughly 40 miles from the main college campus, accessible by paved highway.

The Forestry and Natural Resources Program has a large inventory of specialized equipment. In the natural resources industry, manual surveying equipment, and measurement devices are now being replaced with digital and computer-based tools. Much of the equipment is up to current industry standards, however a continual renewal of this equipment which replicates industry standards (i.e. radio telemetry gear used in wildlife research, GIS software including the latest software version and additional licensing agreements, survey grade GPS units, modern computers capable of supporting advanced software and laser range finders) will be critical purchases to meet advancing industry standards. Capital outlay for these equipment upgrades will be vital in order to stay current with industry standards. The estimated annual cost for maintenance of equipment on-hand is approximately \$45,000. Specialized equipment necessary to run the Program is listed below;

- Mobile Sawmill Components
- Cobra Combi Rock Drill

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- Boulder Buster
- Hydraulic Self-Loading Log Trailer
- Diameter and Logger Tapes
- Relascopes and Clinometers
- Compasses
- Fiberglass and Steel Tapes
- Railroad Chalk & Holders
- US Fish & Wildlife Salvage Permit Fees
- Professional Society Membership Dues
- Society of American Foresters Accreditation Fees
- Chainsaw Components
- Chainsaw Sharpens
- Alaskan Sawmills
- Utility Vehicles
- Animal Packing Saddles & Tack
- Nursery Plant Equipment and Supplies
- Climbing/Aboriculture
- Hand Tool Components
- Multimeter Supplies
- Surveying Equipment
- Mechanic Shop Equipment and Hand Tools
- Skid Steer Masticator Attachment (Teeth, Hoses)
- Skid Steer Log Skidder Components
- Skid Steer Log Tongs Components
- Skid Steer Winch Attachment
- Grip Hoists Components and Cable
- Graphic Large Format 48" Printer
- Communications Radios
- Radio Telemetry Transmitters and Receivers
- Electrofishing Units
- Small mammal traps
- Water Quality Sampling Equipment
- Safety Equipment and Supplies
- River Ranger Uniforms
- Herbarium Supplies
- Fire Pumps, Hoses and Fittings
- Taxidermy Blades and tools
- Equipment Fuel
- Wood Chippers

Equipment needs vary by type and by class. An individual piece of equipment may be sufficient to teach a class of 25 students (i.e. Mobile Saw Mill), however in some cases, multiple pieces of the same equipment may be necessary (i.e. water quality meters, chainsaws, backpack electrofishers). A redundancy in equipment supplies improves the learning experience for students by providing more hands on time.

#### Financial Support Plan:

The financial resources in support of the Reedley College Forestry Program have been an average of \$57,854 over the last 5-year period. Numerous budget sources have contributed to this including district funding, federal funding and vocational program grants.

Average supply/equipment requirement (2010-2011 through 2014-2015) and expenditures for equipment and supplies expenses for fiscal years 2010-2015.

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Fiscal Year	Supplies	Operating Expenses	Equipment	Year Total
2010-2011	\$25,292	\$4,493	\$19,267	\$49,052
2011-2012	\$22,593	\$6,200	\$10,727	\$39,520
2012-2013	\$26,759	\$8,085	\$54,100	\$88,944
2013-2014	\$8,112	\$3,807	\$27,688	\$39,607
2014-2015	\$23,640	\$6,044	\$42,467	\$72,151
5-yr average	\$21,279	\$5,725	\$30,849	\$57,854

From 2010 to 2015, approximately \$154,249 was expended for equipment purchases in the Forestry Program. Annual capital support has been about \$30,849. This has allowed for expansion of curriculum skills through the availability of necessary field studies/laboratory equipment.

**Faculty Qualifications and Availability:**

The Reedley College Forestry and Natural Resources Program have three full-time faculty instructors (Kent Kinney, Joshua Soderlund and Louie Long) with minimum qualifications of master’s degree. There are several adjunct instructors (Robert Cannell, David McCandliss, Craig Cooper, Neil Metcalf, David Kohut, Rodney Roberts, Alexadra Clifton, Matthew Brown and Matthew Meadows) teaching specialized courses. Each faculty member teaches subject material directly related to their respected area of expertise. All faculty members have extensive knowledge of current scientific information and industry practices.

**Licensing or Accreditation Standards:**

The Reedley College Forestry and Natural Resources Program which offers an Associate of Science degree is an accredited program in Forest Technology by Society of American Foresters (SAF). This degree program meets SAF accreditation standards for objectives, curriculum, faculty, students, program, parent-institution support, and physical resources and facilities.

**Based on model curriculum:**

The Reedley College Forestry and Natural Resources Program curriculum is modeled after and fulfills (SAF) accreditation standards in relation to covering the following technical subject matter: Dendrology, Forest Ecology, Silviculture & Reforestation, Protection, Measurements, Land Surveying, Aerial Photo Interpretation, Woods Safety, Harvesting Techniques, Multiple Use of Forest Land, Forest Management Practices and Principles of Human Resources (Personal) Management.

**Item 5. Enrollment and Completer Projections**

This item should justify the number of projected students or “annual completers” to be awarded the degree each year after the program is fully established as entered into the CCC Curriculum Inventory proposal field (discussed in sub-section one of this Guide). The justification must include either: (A) enrollment (student headcount) data or (B) a survey of prospective students and completer projections information.

**(A) Enrollment Data**

		2012-2013		2013-2014	
CB01: Course Department	CB02: Course Title	Annual # Sections	Annual Enrollment	Annual # Sections	Annual Enrollment

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Number			Total		Total
NR-1	Introduction to Forestry	3	81	3	79
NR-108	Introduction to Forestry Field Studies	3	40	3	38
NR-109	Forestry Field Studies I	3	38	3	28
NR-11	Silviculture	1	26	1	25
NR-110	Forestry Field Studies II	4	42	4	44
NR-115	Advanced Field Studies I	2	15	2	10
NR-116	Advanced Field Studies II	1	8	1	19
NR-12	Watershed Ecology	2	42	1	21
NR-14	Principles of Wildlife Management	1	28	2	40
NR-18	Aerial Photo Interp. & Geographic Information Systems	1	26	1	22
NR-19V	Cooperative Work Experience, Natural Resources	1	13	1	16
NR-20	Forest Measurements	2	36	1	18
NR-21	Forest Products	1	11	1	20
NR-3	Computers in Natural Resources	2	33	2	39
NR-30	Forest Recreation	1	16	1	16
NR-31	Animal Packing			1	16
NR-35	Interpretation of Natural Resources	1	26	1	21
NR-36	Natural Resources Law Enforcement	1	23	1	24
NR-4	Forest Ecosystems	2	30	3	57
NR-42	Advanced Wildland Fire	1	11	1	16



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	Technology				
NR-5	Wildland Fire Technology	3	65	4	88
NR-6	Dendrology	2	54	1	27
NR-90	Backpacking	1	13	1	13
NR-91	Wilderness Navigation	1	22	1	16
NR-92	Wilderness Survival	1	22	1	17
		41	721	42	730

(B) Survey

In the case of a survey, the survey questionnaire, a description of the population surveyed, and survey results must be included.

N/A – No survey has been conducted.

**State of California Employment Development Department**  
**Occupational Projections of Employment 2012-2022**  
**Statewide Data for Careers in Forestry**  
Source: <http://www.labormarketinfo.edd.ca.gov/>

<i>Code</i>	<i>Occupation</i>	<i>Projected Employment</i>	<i>Annual Avg. Openings</i>
19-4093	Forest and Conservation Technicians	7,300	290
45-4011	Forest and Conservation Workers	2,200	60
19-4021	Biological Technicians	13,000	520
19-1031	Conservation Scientists	1,700	60

**Item 6. Place of Program in Curriculum/Similar Programs**

Before completing this section, review the college’s existing program inventory in the CCC Curriculum Inventory, then address the following questions:

- a) Do any active inventory records need to be made inactive or changed in connection with the approval of the proposed program? If yes, please specify.

This Forestry A.S. degree and its counterpart a Natural Resources A.S. degree will replace the present Forestry/Natural Resources A.S. degree. In order for students who are presently working toward Forestry/Natural Resources A.S. to complete that degree it will be not become inactive until Fall 2018.

- b) Does the program replace any existing program(s) on the college’s inventory? Provide relevant details if this program is related to the termination or scaling down of another program(s).

See Item 6. a)

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c) What related programs are offered by the college?

No other related programs are offered at Reedley College or within the State Center Community College District.

**Item 7. Similar Programs at Other Colleges in Service Area**

N/A – There are no other colleges within the defined Reedley College service area that offer a similar instructional program.

**List of Reedley College Forestry/Natural Resources Advisory Committee Members**

<b><u>First name</u></b>	<b><u>Last name</u></b>	<b><u>Job Title</u></b>	<b><u>Business Affiliation</u></b>
David	Allen	Fire Management Officer	Sequoia/Kings Canyon National Park
Van	Arroyo	Deputy Chief	Sierra National Forest
Carolyn	Ballard	District Fuels Officer	Sierra National Forest
Stephen	Barber	State Park Ranger	Millerton State Park
Morgan	Barnes	Park Ranger - Eastman Lake	Eastman Lake - United States Army Corps of Engineers (USACE)
William	Bayse	National Park Service Fire Manager	Sequoia/Kings Canyon NPS
Robert	Benancourt	Fire Captian, Engine 32	Sierra National Forest
Robert	Benik	Battalion Chief	Sequoia National Forest
Teresa	Benson	Forest Service Fire Manager	USDA Forest Service Hume Lake RD SQNF
Bonnie	Bladen	Native Plant Nursery Owner	Intermountain Nursery
Matt	Brown	Environmental Land Management Consultant	Pacific Gas and Electric Company
Darcy	Brown	Environmental Law Advisor	San Joaquin College of Law (student)
Carlos	Cabanas	Fire Captian, Engine 341	Sierra National Forest
Sandra	Caldwell	Reedley College President	Reedley College
Jeremy	Caldwell	Park Manager - Pine Flat Lake	Pine Flat Lake - United States Army Corps of Engineers (USACE)
Shelby	Charley	Division Chief	Sequoia National Forest
David	Clark	Agriculture and Natural Resources (AGNR) Department Dean	Reedley College Division Dean
Don	Dukleth	Registered Professional Forester	Southern California Edison Company
Larry	Duysen	Sawmill Owner	Sierra Forest Products
Kevin	Elliott	Sequoia National Forest Supervisor	Sequoia National Forest
Patrick	Emmert	Registered Professional Forester	Southern California Edison Company
James	Fouch	Timber Making Crew Supervisor	Sierra National Forest
Ron	Garcia	District Fire Mangement Officer	Sierra National Forest

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Tim	Garrison	City of Reedley Fire Captain	City of Reedley Fire Department
Ron	Gerstenberg	Reedley College Forestry and Natural Resources Instructor (retired)	Reedley College (retired)
Julissa	Gonzalez	Employment Coordinator	USDA Forest Service - Central California Consortium (CCC)
John	Goss	Battalion Chief	Sierra National Forest
Dean	Gould	Sierra National Forest Supervisor	Sierra National Forest
Daniel	Jeffcoach	Agriculture Biology/Forestry Instructor	Sequoia High School - Tulare County
Mark	Johnson	Board Director Sequoia Lake, Reedley College Forest	Golden State YMCA
Kent	Kinney	RC Forestry and Natural Resources Program Instructor	Reedley College
Dan	Kleinman	Operations Section Chief, National Incident Management Organization (NIMO)	USDA Forest Service, Washington Office
David	Kohut	Registered Professional Forester/ RC and ROP Instructor	Valley Regional Occupational Program (ROP)
Ray	Laclergue	Native Plant Nursery Owner	Intermountain Nursery
Suri	Littlebuck-Naylor	Emergency Communication Center (ECC) Chief	Sierra National Forest
Fabrizio	Lofaro	Valley ROP Coordinator	Valley Regional Occupational Program (ROP)
Elizabeth	Long	Camp Executive Director and CEO, Sequoia Lake, Reedley College Forest	Golden State YMCA
Louie	Long	RC Forestry and Natural Resources Program Instructor	Reedley College
Greg	Marks	OHV Manager and Forest Accessibility Coordinator (retired)	Sierra National Forest (retired)
Vickie	Marks	Law Enforcement Officer Staff	Sierra National Forest
Pedro	Martinez	Battalion 91, Training Specialist	Sierra National Forest
Deborah	Marvin-Deeter	Valley ROP Director	Valley Regional Occupational Program (ROP)
Kevin	Mayer	Special Agent	USDA Forest Service, Sierra National Forest
David	McCandliss	RC Forestry and Natural Resources Program Instructor (Fire Technology)	Reedley College
Neil	Metcalf	District Fire Mangement Officer (retired) / FNR Instructor (Fire Technology)	Sequoia National Forest (retired) / Reedley College
Deron	Mills	Assistant Fire Management Officer	Yosemite National Park
Andrew	Misch	Western Recruiter	The Davey Tree Expert Company
John	Mount	Forest Manager/ Registered Professional Forester	Southern California Edison Company (retired)
Tim	Murphy	Battalion Chief	Sequoia National Forest
Issac	Naylor	Battalion Chief	Sierra National Forest
Lily	Nieves	CCC Program Specialist	USDA Forest Service - Central California Consortium (CCC)
Ron	Nishinaka	State Center Community College Trustee and Board Member	State Center Community College District Board of Trustees
Michael	Nolen	Timber Culturist	Sierra National Forest
James	Oftedal	Central California Consortium Director	USDA Forest Service - Central California Consortium (CCC)
Marian	Picher	Park Ranger - Pine Flat Lake/RC Alumnus	Pine Flat Lake - United States Army

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			Corps of Engineers (USACE)
Valerie	Pilsbury	Supervisory Park Ranger/ Interpretive Specialist	Sequoia and Kings Canyon National Parks
Ray	Porter	High Sierra District Ranger	Sierra National Forest
John	Ramaley	Forester III, Forest Practice Manager	California Department of Forestry and Fire Protection - CAL FIRE
Joseph	Reyes	Fire Mangement Officer	Sierra National Forest
Brian	Rueger	Registered Professional Forester	Consulting Forester
Diane	Savin-Dukleth	Asst. Manager Quality Control Group - Timber	Sierra National Forest
Edwin	Simpson	Fresno Unit Forester	California Department of Forestry and Fire Protection - CAL FIRE
Brent	Skaggs	Fire Chief	Sequoia National Forest/ Giant Sequoia National Monument
Phil	Smith	Park Manager - Hensley Lake	Hensley Lake - United States Army Corps of Engineers (USACE)
Joshua	Soderlund	RC Forestry and Natural Resources Program Instructor	Reedley College
Frank	Spandler	Tulare Unit Assistant Chief	California Department of Forestry and Fire Protection - CAL FIRE
Ryan	Stewart	Forest Manager/Registered Professional Forester	Southern California Edison Company
Russ	Suydam	Sequoia Lake, Reedley College Forest, YMCA staff volunteer	Golden State YMCA
Jalisca	Thomason	Science/ Forestry Instructor	Sequoia High School - Tulare County
Laurie	Tidyman-Jones	Reedley College Counselor	Reedley College
Denise	Tolmie	Forest Fuels Officer	Sierra National Forest
Krista	Tomlinson	Senior Environmental Scientist, FNR Advisory Committee Chairman	California Department of Fish and Wildlife
Mark	Watkins	Biologist	
John	Ziegler	Fire Management Officer	Sequoia and Kings Canyon National Parks

REEDLEY COLLEGE FORESTRY AND NATURAL RESOURCES PROGRAM  
ADVISORY COMMITTEE

December 11, 2012

Minutes

**Call to Order-** The meeting was called to order by chairmen, John Exline, at 12:50 PM

**Roll Call & Introduction of Members-** Present were 29 members

Morgan Barnes	Mike Ketscher	Valerie Pilsbury
William Bayse	Kent Kinney	Brian Rueger
Darcy Brown	David Kohut	Diane Savin-Dukleth
Larry Duysen	David Lopes	Edwin Simpson
John Exline	Alex Luscutoff	Joshua Soderlund
Ron Gerstenberg	Pedro Martinez	Frank Spandler
Julissa Gonzalez	Deborah Marvin-Deet	Krista Tomlinson
Claudia Habib	David McCandliss	Tiffany Wade
George Heaton	John Mount	Michael White
David Hembree	Michael Nolen	

**Lunch-** A meal by Reedley College Food Services was provided as a working lunch.

**Minutes-** A motion to approve past minutes was made by Kent Kinney, seconded and passed by voice vote.

**Reports:**

**ROP-** David Kohut reported that the Regional Occupation Program has 16 high school students this year. ROP has taught a total of 10 classes at Reedley College and continues to coordinate equipment and internship employment with the RC NR instructors and technician. David Kohut reports that 8 students have been placed in summer jobs and that most ROP students attend Reedley College.

**Student Employment Placement 2012-** Kent Kinney reported that 60 students had internships (paid and volunteer) working in the National Forests, National Parks, Army Corps of Engineers, state and local agencies. We have expanded our geographic representation by having had some students work in Oregon and Washington.

**College Forest, Sequoia Lake-** David Hembree reported that YMCA is excited and pleased about relationship with Reedley College-Forestry/Natural Resources Program. The student work done on the two-day field studies classes help set stage to open and close camp for the season by activities such as clearing fallen trees and building trails. The camp has developed a Site Master Plan which includes a long-term Timber Management Plan and Non-Industrial Timber Harvest Plan.

## **Old Business:**

**Certification for Reedley College Fire Courses-** David McCandliss reports that he is teaching five National Wildfire Coordinating Group (NWCG) classes each class having a certificate. The 105 students within these classes receive the basic training that allows them to have a leg up on those that have never worked on a fire and saves the agencies from having to train them. David proposes that the NR 42-Advanced Fire Behavior Class needs a prerequisite of having fire experience so perhaps it needs to be offered spring semester after students have had summer internships. Ron Gerstenberg suggested that it could be offered as a short course either 2<sup>nd</sup> nine weeks of fall semester or 1<sup>st</sup> nine weeks of spring semester. David McCandliss recommended that perhaps there could be a wildland firefighting degree which would include 5 - NWCG certificates, 2 – CPR First Aid/ First Responder certificates, new classes fuels management and fire ecology. He also thanked Sierra and Sequoia National Forests for equipment and demonstration.

## **New Business:**

**Full-time Staff Changes-** Dave Lopes presents the need for a 3<sup>rd</sup> full-time position due to the simultaneous resignation of Ian Stone and retirement of Robert Cannell. Joshua Soderlund was hired to replace Ian Stone's position and he introduced himself to the advisory committee. Kent Kinney stated that Reedley College is the only SAF accredited 2-year college in California and due to accreditation guidelines the instructor to forestry major student is to be 1 to 20. Presently the program has over the limit of 40, so we need that 3<sup>rd</sup> full time position preferably with a biology background. John Exline and Krista Tomlinson speak of the importance of writing letters to the Chancellor and Trustees of SCCC in support of the forestry program.

**Adjunct Staff-** Kent Kinney reported that the Forestry program needs more adjunct instructors so that more classes can be offered which will meet the needs of students and help them finish their degrees. He asked for help in finding adjunct instructors that specialize in biology and fire management.

**Technician (Classified) Staff-** Kent Kinney states that the Forestry program has not had a technician in 27 years and Ron Gerstenberg confirms. Kent happily introduces the Forestry program's technician George Heaton who has improved the program by helping supervise students and maintaining the tools.

**Facilities Changes-** Kent Kinney reported that program has developed a chainsaw shop for repair/maintenance and storage area. The program has purchased two C-Train storage units for tools; one located on Reedley campus and the other at Sequoia Lake. The college is developing a GIS (Geographic Information System) computer lab which will be housed in the AGNR department and maintained by the Forestry program. Darcie Brown stated that if program has questions about GIS software and applications that Advisory Committee can help. Kent Kinney explained need for a 25 passenger bus for field trips and 4X4 vehicle.

**Budget-** Kent Kinney reported that there is some federal Perkins money coming in for the purchase of equipment. In general due to decreased state funding the program will need to tighten up budget for the immediate future.

**Course Availability 2013-** Kent Kinney reported that the program was to have a 1/3 reduction of classes to be offered Spring 2013. All classes taught by adjunct instructors were supposed to be cut, yet due to passage of Prop 30 some classes were brought back on the schedule.

**Curriculum Change-** Kent Kinney reported that program needs to meet SAF (Society of American Foresters) accreditation and also state accreditation which is requiring more GE (general education). Presently the forestry/natural resource major degree is 73 units. Kent proposed the possibility of two separate degrees Forestry and Natural Resources both 60 units. Forestry degree will include all SAF required classes and the NR degree will have classes tailored for other careers, such as firefighting or recreation. This curriculum change could take a few years to implement. Dr. Claudia Habib stated that the college is under fire because students are taking too long to receive a 2-year degree. She realized the need for 3<sup>rd</sup> instructor and that the taxpayers place importance on job placement. Kent stated his confidence in the administrators at Reedley College. Kent stressed the importance of students completing either a degree or certificate and that the fire discipline will help us gain amount of completers. Darcie Brown stated that NR 7 was her favorite class and that professional guest speakers can help fill gaps in class curriculums. John Exline states that it is the right thing to split program into two degrees and stressed importance of SAF accreditation. Kent Kinney reported that the State Chancellor has stated that all AGNR programs will emphasize water, environment and agriculture.

### **Student Employment 2013-**

Forest Service:

John Exline reported that the normal hiring process has changed to the Pathways Program which requires all applicants to use USA Jobs. He will keep the college informed on temporary positions.

Mike Ketcher reported he had a great group of 18 Reedley College students, but said there was an issue that if student was registered for Fall semester than he/she had to quit August 13<sup>th</sup>.

Park Service:

William Basye reported the park will hire the same number of temporary positions about 5-6 at GS-03 level. He stressed the importance of any certification or training you may have because there are around 400 applicants a year. The Helitack crew will have 1 seasonal position.

Valerie Pilsbury reported that interpretation will hire the same number or less of seasonal employees.

Diane Savin-Dukleth reported that the SAF-High Sierra Chapter meetings are great places to meet possible employers.

State:

Steve Barber reported on the 2 local reservoirs that there are 2 maintenance positions at Hensley Lake and 1 maintenance/2 ranger positions at Millerton Lake.

Frank Spandler from CalFire reported that Mountain Home and Jackson Demonstration State Forests hire 4 temporary forestry aids a season.

Edwin Simpson reported that he can talk to students about career with CalFire and that they might have land available for labs.

Krista Tomlinson from California Department of Fish and Game reported that seasonal positions such as scientific aid, fish & wildlife technician and fish & game assistant are available; she will keep us posted. There are also employment opportunities with Department of Water Resources.

Darcie Brown reported that volunteer and internship positions with the non-profit sector can provide students with work experience.

**Next Meeting-** The spring 2013 meeting, in conjunction with Valley ROP, will announced. The fall 2013 meeting will most likely be held at the Sierra National Forest Supervisor's office again, during the week of Reedley College final exams.

**Adjournment-** The meeting was adjourned at 3:00 PM

Minutes recorded by Kent Kinney



**REEDLEY COLLEGE  
FORESTRY ADVISORY COUNCIL  
FALL MEETING**

October , 2005

**MINUTES**

Lunch in the R.C. Cafeteria Staff Dining Room at 12:00 p.m.

**Present:** Don Dukleth, John Exline, Frank Fonseca, George Spach, Deborah Marvin-Deeter, Ron Gerstenberg, Jim Oftendal, Carolyn Rose, Brian Rueger, Gary Whitson, Barbara Hioco, Bud West, Kimberly Perry, Laurie Tidyman-Jone, Kent Kinney, Amie Mazzoni, Jason Pinkerton

**Meeting Called to Order** – 1:00 p.m.

- New Advisory Chair, John Exline, was introduced
- Self-introductions were made

**Minutes of Spring 2005 Meeting** – Approved

**Reports**

- Enrollment Update  
Currently 30 new students  
Anticipate strong spring enrollment
- Student Internships  
Currently students still on the job throughout California – numerous in Sierra and Sequoia National Forests, Sequoia and Yosemite National Park, and Plumas National Forest

**Old Business**

- GIS Software  
Numerous uses – talk with other departments (Business & Geography) to sell the items/GIS use to other programs and instructors.
- Recruitment  
30 plus schools visited last year.  
FFA field days.  
Webpage – need updates; won't come up on Google. Webpage is difficult to get through.  
Testimonials during FFA competition (ag kids)  
Get in contact with CCC.  
Personal letters to each forest.  
Where are the primary target recruitment areas? As of now, high schools.

Recruitment (continued)

Invite counselors to visit the program.  
Students who have gone through CCC.  
More influence from high schools to transfer to university.

## New Business

- New Course - projects course in the short term: Wilderness survival, backcountry skills
- Equipment – animal traps, GPS unit, log trailer
- Internships
  - Zero credit for students taking an internship outside of California.
  - There must be another way to offer internships outside of the state.
  - Job evaluations at the end of the summer.
  - Committee to write a letter to request re-opening this issue.
  - Contact may come in the form of emails, telephone, and personal contact.
- Certification Courses
  - Chainsaw 212 – bring in cert. employee to do final test.
  - First aid/CPR – instructors to offer lecture.
- Program Review
  - Overview – process done every five years.
  - Unit reduction – overall program get down to 60 units.
  - Course changes – possible reduction in courses, NR 25, NR 19V
  - SAF – must stay within recognition
  - Class & lab
    - Upgrade or expand facilities
    - Hopefully relieve NR faculty with new buildings
    - Need to mention difficulty with preparation rooms and open labs prior to lab period.
  - Staffing
    - Technician
      - Need due to transportation, paid technician (full time), needed for lab preparation and tool room maintenance.
      - Fulltime certified employee is costly.
    - Instructors
      - Try to maintain a solid staff to maintain the program.
      - During lean times, develop other avenues – in-service training, farm out to other department.
  - Vehicles
  - Subcommittee
    - Gary Whitson, John Exline, Don Dukleth, George Spach, Mary ????, Frank Fonseca
    - Agree to read and provide input regarding Program Review
    - Meeting – Thursday, December 8<sup>th</sup>, 9:00 a.m.

# FORESTRY AND NATURAL RESOURCES

## CENTRAL VALLEY/MOTHERLODE REGION

AMADOR, ALPINE, CALAVERAS, FRESNO, INYO, KERN, KINGS, MADERA, MARIPOSA, MERCED, MONO, SAN JOAQUIN, STANISLAUS, TULARE AND TUOLUMNE COUNTIES



### PROGRAM AND OCCUPATIONAL PROFILE

### With East and South Sub-Region Detail

## GEOGRAPHY

California is rich in natural resources. Air, water, plants, and animals are natural resources. So are salt, coal, and oil. Even sun and wind are natural resources. People depend on natural resources for food, shelter, and clothing. Each of California's regions has a variety of natural resources. In the mountain regions, forests provide wood. Forests also conserve water, helping rainwater sink into the ground. The Sacramento and San Joaquin rivers, which run through the Central Valley, are fed mainly by the abundant rains and melting snows of the Sierra Nevada's western flank. Channels and pipelines later carry this water from the rivers to farms and cities in drier areas. This helps farmers in the Central Valley raise crops during the three growing seasons. The Central Valley is the leading farm region in the United States for fruits, vegetables and nuts.

### BACKGROUND

In spring 2016, the Central Valley/Motherlode Region Center of Excellence was asked to provide labor market information for eleven Forestry and Natural Resources occupations.



The heartland of California is the Central Valley, which runs for 450 miles (725 km) through the center of the state, forming a trough between the Coast Ranges to the west and the Sierra Nevada to the east. The valley is the state's agricultural center. Its single opening is the delta through which the Sacramento and San Joaquin rivers drain into San Francisco Bay. The valley is sealed off by the Cascade Range to the northeast and by the Klamath Mountains to the northwest. In the far north the terrain is rugged and heavily forested, becoming wetter on the coastal side and drier and barren in the higher northeast. In the south the Central Valley is closed off by the transverse ranges, most notably the Tehachapi Mountains, which are regarded as a dividing wall between southern and central California. The San Joaquin Valley in the south embraces more than three-fifths of the entire basin.

Information and data for this report are the following public and proprietary sources: Economic Modeling Specialists (EMS), Bureau of Labor Statistics and O\*NET online. More information about the Centers of Excellence is available at [www.coecc.net](http://www.coecc.net).

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## SECTOR & INDUSTRY

Forestry and Natural Resources fall under the Agriculture, Forestry, Fishing and Hunting sector (NAICS code 11). There are five primary industries that employ Forestry and Natural Resources workers, which are as follows:

- Local Government, Excluding Education and Hospitals
- Crop Production
- Farm Labor Contractors and Crew Leaders
- Federal Government, Civilian, Excluding Postal Service
- Animal Production and Aquaculture

## OCCUPATIONAL EMPLOYMENT

Forestry and Natural Resources within the Agriculture, Forestry, Fishing and Hunting sector focuses on the conservation and restoration of the earth's natural resources through hands-on study of the ecology, stewardship, and management of forest, woodland, and grassland ecosystems.

In the Central Valley/Motherlode Region, there were approximately 11,500 Forestry and Natural Resource (FNR) workers in 2015 with a forecasted growth rate of 3.2% or 407 jobs annually. Although two of the occupations indicate a decline in the number over the next five years, there are annual opening projections due to retirements.

The following tables contain the employment estimation data for the Forestry and Natural Resources occupations selected for inclusion in this study. Between 2016 and 2021, the industry employers are projected to add 1,865 new jobs and replace about 170 workers due to retirements. First-Line Supervisors of Farming, Fishing, and Forestry Workers is the largest position in the group followed by Firefighters with over 4,900 and almost 4,000 respectively.

### Central Valley/Motherlode Region

Occupations	2016 Jobs	2021 Jobs	2016 - 2021 % Change	Annual Openings	Median Hourly Earnings
Zoologists and Wildlife Biologists	188	196	4%	7	\$24.32
Conservation Scientists	185	177	-4%	6	\$30.24
Foresters	61	62	2%	3	\$28.37
Biological Technicians	595	633	6%	26	\$17.01
Forest and Conservation Technicians	1323	1312	-1%	54	\$15.01
First-Line Supervisors of Fire Fighting and Prevention Workers	385	412	7%	22	\$40.99
Firefighters	3,389	3,568	5%	132	\$24.59
Forest Fire Inspectors and Prevention Specialists	18	19	6%	Insf. Data	\$34.57
Fish and Game Wardens	129	134	4%	5	\$49.54
First-Line Supervisors of Farming, Fishing, and Forestry Workers	4,904	5,006	2%	135	\$17.02
Forest and Conservation Workers	468	497	6%	16	\$10.29

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**South Central Valley Sub-Region  
(Fresno, Kern, Kings, Madera and Tulare Counties)**

Occupations	2016 Jobs	2021 Jobs	2016 - 2021 % Change	Annual Openings	Median Hourly Earnings
Zoologists and Wildlife Biologists	147	152	3%	5	\$23.69
Conservation Scientists	127	122	-4%	4	\$30.53
Foresters	39	40	3%	Insf. Data	\$28.65
Biological Technicians	350	376	7%	16	\$17.27
Forest and Conservation Technicians	556	551	-1%	22	\$14.86
First-Line Supervisors of Fire Fighting and Prevention Workers	201	218	8%	12	\$46.18
Firefighters	1,824	1,939	6%	75	\$27.62
Forest Fire Inspectors and Prevention Specialists	12	13	8%	Insf. Data	\$34.57
Fish and Game Wardens	96	99	3%	4	\$50.99
First-Line Supervisors of Farming, Fishing, and Forestry Workers	3,630	3,696	2%	99	\$17.09
Forest and Conservation Workers	301	313	4%	9	\$10.08

**East Central Sub-Region  
(Alpine Inyo, Mono, Mariposa and Tuolumne Counties)**

Occupations	2016 Jobs	2021 Jobs	2016 - 2021 % Change	Annual Openings	Median Hourly Earnings
Zoologists and Wildlife Biologists	<10	<10	Insf. Data	Insf. Data	Insf. Data
Conservation Scientists	11	11	0%	Insf. Data	\$23.30
Foresters	<10	<10	Insf. Data	Insf. Data	Insf. Data
Biological Technicians	96	97	1%	3	\$15.20
Forest and Conservation Technicians	601	597	-1%	24	\$15.15
First-Line Supervisors of Fire Fighting and Prevention Workers	47	49	4%	2	\$34.16
Firefighters	341	351	3%	11	\$20.38
Forest Fire Inspectors and Prevention Specialists	<10	<10	Insf. Data	0	Insf. Data
Fish and Game Wardens	<10	<10	Insf. Data	Insf. Data	Insf. Data
First-Line Supervisors of Farming, Fishing, and Forestry Workers	42	42	0%	Insf. Data	\$27.17
Forest and Conservation Workers	<10	<10	Insf. Data	Insf. Data	Insf. Data

The majority of these other occupations are Green. Green occupations will likely change as a result of the green economy. Green economy activities and technologies are increasing the demand for occupations, shaping the work and worker requirements needed for occupational performance, or generating new and emerging occupations.

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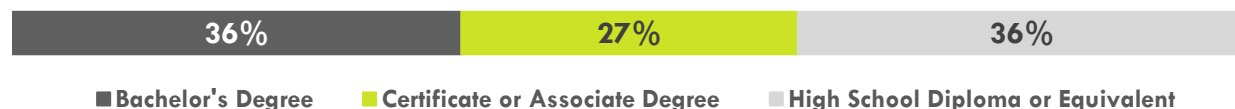
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## EDUCATION/WORK EXPERIENCE/ON-THE-JOB (OTJ) TRAINING

All eleven positions fell within the “middle-skilled” range with a “typical entry level education” of at least a high school diploma up to a Bachelor’s degree. These educational requirements were sometimes combined with work experience or OTJ training. The distributions of each area are as follows:

### Typical Entry-Level Education



### Work Experience



### On-the-Job Training



**Firefighters** control and put out fires, and respond to emergency situations where life, property, or the environment is at risk.

**Forest Firefighters have a BRIGHT OUTLOOK!**

**Conservation Scientists and Foresters** manage the overall land quality of forests, parks, rangelands, and other natural resources. They provide close supervision of an occupational therapist or occupational therapy assistant, perform only delegated, selected, or routine tasks in specific situations. These duties include preparing patients and treatment rooms.

**Forest and Conservation Workers** measure and improve the quality of forests. Under the supervision of foresters and forest and conservation technicians, they develop, maintain, and protect forests.

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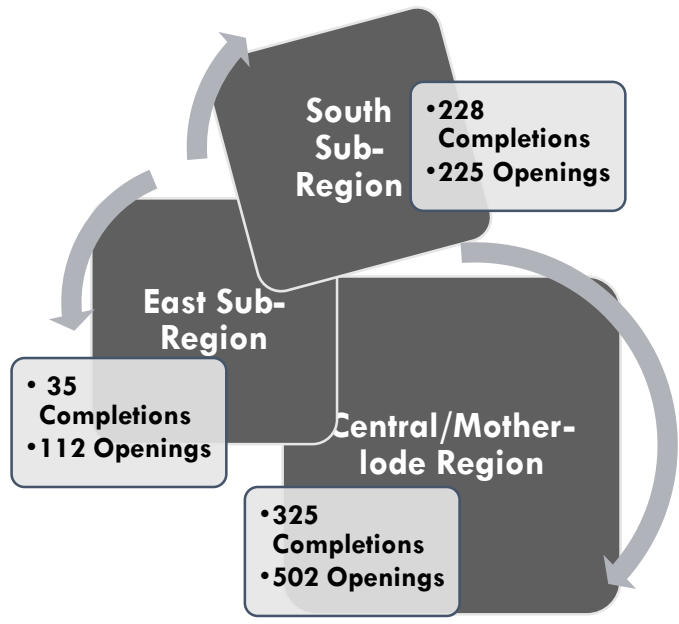
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Of the eleven institutions in the Central Valley/Motherlode Region that provide Forestry and Natural Resource education and training, ten of them supplied 325 program completers in 2014; 295 of these awards were distributed among eight Community Colleges and thirty were California State University awards. The number and type of awards by Community College have been included below.

Bakersfield College	<ul style="list-style-type: none"> <li>• 22 Degrees</li> <li>• 22 Certificates</li> </ul>
College of the Sequoias	<ul style="list-style-type: none"> <li>• 12 Degrees</li> <li>• 56 Certificates</li> </ul>
Columbia College	<ul style="list-style-type: none"> <li>• 17 Degrees</li> <li>• 18 Certificates</li> </ul>
Fresno City College	<ul style="list-style-type: none"> <li>• 8 Degrees</li> <li>• 50 Certificates</li> </ul>
Merced College	<ul style="list-style-type: none"> <li>• 5 Degrees</li> <li>• 4 Certificates</li> </ul>
Modesto Junior College	<ul style="list-style-type: none"> <li>• 17 Degrees</li> <li>• 25 Certificates</li> </ul>
Reedley	<ul style="list-style-type: none"> <li>• 9 Degrees</li> <li>• 23 Certificates</li> </ul>
San Joaquin Delta College	<ul style="list-style-type: none"> <li>• 5 Degrees</li> <li>• 2 Certificates</li> </ul>

This number of completers or supply fell short of demand by 35% in 2014. This percentage declined to 7% when just the South Central Region counties were evaluated, but jumped up to 69% when only the East Central Region was appraised.



*Cerro Coso Community College does offer Forestry and Natural Resources programs, but the college had zero completers in 2014.*

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