

CAREER SERVICES
PHASE II EMPLOYER SURVEY REPORT 2009
NATURAL RESOURCES MANAGEMENT
College of Agriculture, Food and Environmental Sciences

PROJECT BACKGROUND

THREE PHASE ASSESSMENT PLAN

Career Services collaborated with the Natural Resources Management (NRM) Department to assess the academic programs related to Forestry & Natural Resources (FNR) and Environmental Management & Protection (ENVM) through employer surveying. A three phase assessment plan was established. Phase I included the assessment of:

- Quality of NRM Graduates
- Industry Readiness, Performance and Promotion
- Student Learning Outcomes
- Employer Value on Student Learning Outcomes
- Salary Scale Information

An Employer Survey Instrument was designed to assess each of these areas. In Phase I, a pilot program was established to test the instrument utilizing the FNR/ENVM Advisory Council members. The student learning outcomes were aligned with accreditation standards which will be used for upcoming program review.

In Phase II, the employer base was expanded to include a broader range of employers and industry representatives which significantly increased industry participation. The findings from the Phase II Employer Survey Report will be covered in this report.

In Phase III, the survey instrument will be modified to assess student perceived learning.

OBJECTIVES

The following objectives were established for this report:

1. Graduate Qualities
Measure the quality of graduates, industry readiness, performance and promotion capabilities of NRM graduates (FNR & ENVM Programs).
2. Student Learning Outcomes
Measure skill attainment related to student learning outcomes established by the department, in alignment with accreditation standards.
3. Employer Values
Measure the importance employers place on the student learning outcomes.
4. Salary Information
Determine the salary scales information on graduates.

PROGRAM DESIGN

The Natural Resources Management Department and Career Services developed an employer survey that was tailored to meet the unique and specific needs of the academic programs. The survey was broken into two sections as indicated below:

Section 1: Graduate Assessment

Quality	Satisfied with the quality of FNR and ENVM graduates
Industry Readiness	Able to make an immediate contribution to the workplace
Performance	Able to take on increase responsibilities after one year of employment
Promotion	Possess the skill sets to be promoted within three years

Section 2: Student Learning Outcomes

NRM Fundamentals	Demonstrate competency in scientific and technical knowledge related to forestry and environmental management
Specialization Knowledge	Demonstrate depth of knowledge, skills, and perspectives within their selected natural resource management specialization
Quantitative Knowledge	Demonstrate proficiency in quantitative skills and information management
Problem Solving	Able to use traditional and non-traditional approaches to define a problem, identify potential alternatives, gather appropriate knowledge and information to formulate and articulate a solution
Communication	Demonstrate effective speaking skills
Writing	Demonstrate effective writing skills
Diversity	Understand diverse perspectives and generate solutions that incorporate them
Leadership	Demonstrate effective peer leadership
Ethics	Understand professional and ethical responsibilities as foresters, natural resource managers and environmental managers including the societal impact of FNR/ENVM
Interdisciplinary Teamwork	Demonstrate effective participation in teams
Life-Long Learning	Engage in continuous education and keep current within the field

Refer to Appendix A for the survey form.

STUDY PROFILE

Surveys were collected during the Spring and Summer Quarters of 2009. The surveys were completed by industry leaders, managers, and supervisors. Thirty-nine (39) different employers participated in the survey, resulting in seventy-two (72) survey responses. The following chart breaks down participation by the two academic programs.

<i>NRM Programs</i>	<i>Employers</i>	<i>Surveys</i>
Forestry & Natural Resources	37	42
Environmental Mgmt & Protection	28	30

Employers included organizations as Bureau of Land Management, CALFIRE, California State Parks, Central Valley Regional Water Quality Control Board, County of Kern, County of Los Angeles Fire Department, Dudek, ESRI, HDR, Humboldt Redwood Company, LA County Fire Department, Mendocino Redwood Company, National Park Services, Nevada Fire Safe Council, North Lake Tahoe Fire District, Port of Los Angeles, Rainforest Alliance, Resource Conservation District, Sequoia & King Canyon National Park, SLO County Air Pollution Control District, SLO County Planning, U.S Fish & Wildlife and USDA Forest Services.

Refer to Appendix B for a detailed breakdown of employer participation by department.

PROJECT FINDINGS

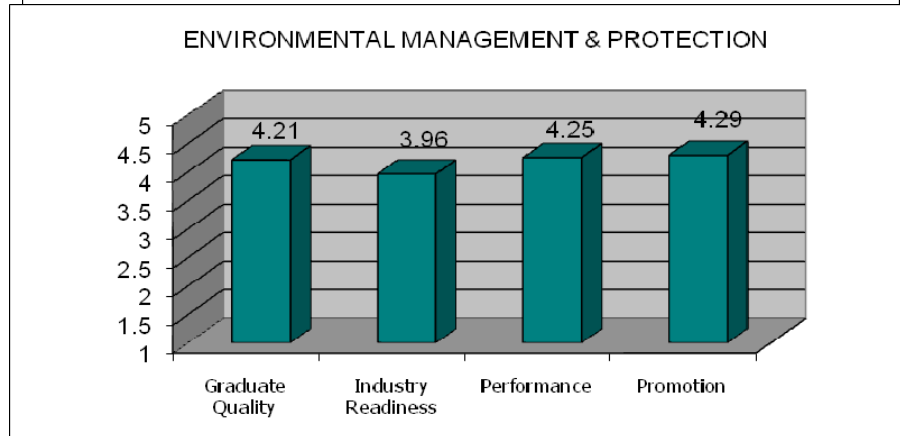
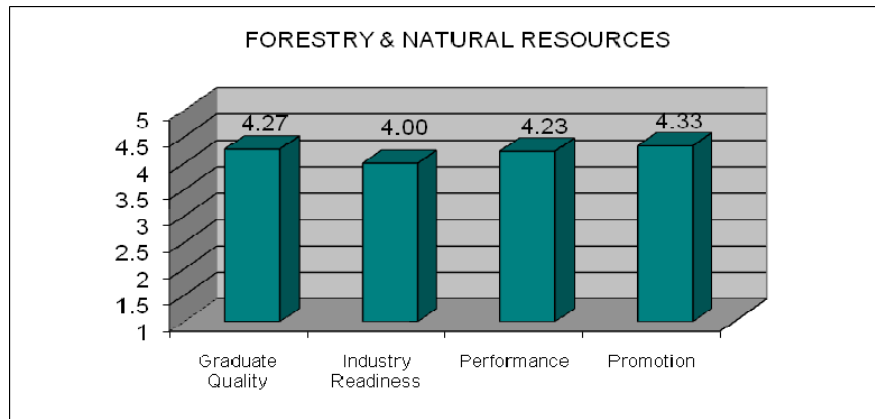
1. GRADUATE QUALITIES

OBJECTIVES: Measure the quality of graduates, industry readiness, performance and promotion capabilities of NRM graduates (FNR & ENVM Programs). Measure the importance employers place on the student learning outcomes.

METHODOLOGY: Surveys were completed by employers to evaluate NRM graduates using a 5-point scale (*1 = lowest; 2 = low; 3 = medium; 4 = high; 5 = highest*).

FINDINGS: Employers reported the following findings:

QUALITY OF GRADUATES – The survey assessed graduate quality, industry readiness, performance, and promotion capabilities. The chart below is a graphical presentation of scale score averages for each of the academic programs.



The following chart reports the same data, but it has been formatted differently, reporting numerically on each of the scale score categories. This provides a breakdown of responses and is particularly helpful in analyzing the data.

QUALITY OF GRADUATES – The survey assessed overall quality (*My company is satisfied with the quality of NRM graduates*).

QUALITY OF GRADUATES	Lowest	Low	Medium	High	Highest	Survey Responses	Scale Scores
<i>Scale Scores</i>	1	2	3	4	5		Average
FNR	0	0	3	24	14	41	4.27
ENVM	0	0	2	19	8	29	4.21

INDUSTRY READINESS – The survey assessed industry readiness (*NRM graduates are able to make an immediate contribution to the workplace*).

INDUSTRY READINESS	Lowest	Low	Medium	High	Highest	Survey Responses	Scale Scores
<i>Scale Scores</i>	1	2	3	4	5		Average
FNR	0	0	12	16	12	40	4.00
ENVM	0	0	9	11	8	28	3.96

PERFORMANCE – The survey assessed performance (*NRM graduates are able to take on increase responsibility after one year of employment*).

PERFORMANCE	Lowest	Low	Medium	High	Highest	Survey Responses	Scale Scores
<i>Scale Scores</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>		Average
FNR	0	1	5	18	16	40	4.23
ENVM	0	0	3	15	10	28	4.25

PROMOTION – The survey assessed promotion capabilities (*NRM graduates possess the skill sets to be promoted within three years*).

PROMOTION	Lowest	Low	Medium	High	Highest	Survey Responses	Scale Scores
<i>Scale Scores</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>		Average
FNR	0	0	5	16	18	39	4.33
ENVM	0	0	4	12	12	28	4.29

2. STUDENT LEARNING OUTCOMES

OBJECTIVE: Measure skill attainment related to student learning outcomes established by the department, in alignment with accreditation standards.

STANDARDS: The NRM Department identified the student learning outcomes that may be applied to Forestry & Natural Resources and Environmental Management & Protection. Each student learning outcome is fully defined within the survey instrument to assist employers in the scoring process.

METHODOLOGY: Surveys were completed by employers to measure the success of FNR and ENVM graduates based on student learning outcomes, using a 5-point scale (*1 = lowest; 2 = low; 3 = medium; 4 = high; 5 = highest*).

FINDINGS: The following charts indicate the scale score averages and the numeric value for each of the student learning outcomes.

Employers reported the following findings:

Natural Resources Management		Low	Medium	High	Highest	Total	Scale
Forestry & Natural Resources		Lowest				Surveys	Score
LEARNING OUTCOMES		1/2	3	4	5		Average
1	Ethics	0	7	15	9	41	4.29
2	Interdisciplinary Teamwork	1	6	15	19	41	4.27
3	Problem Solving	0	10	13	16	39	4.15
4	NRM Fundamentals	1	5	28	7	41	4.02
5	Quantitative Knowledge	1	4	29	7	41	4.00
6	Communication	0	11	21	9	41	3.95
7	Life-Long Learning	0	11	20	7	38	3.89
8	Writing	1	12	18	9	40	3.88
9	Specialization Knowledge	1	11	19	8	39	3.87
10	Diversity	2	14	15	8	39	3.74
11	Leadership	1	14	21	5	41	3.73

Natural Resources Management		Low	Medium	High	Highest	Total	Scale
Environmental Mgmt & Prot		Lowest				Surveys	Score
LEARNING OUTCOMES		1/2	3	4	5		Average
1	Ethics	0	6	11	12	29	4.21
2	Interdisciplinary Teamwork	1	6	11	11	29	4.10
3	Problem Solving	0	7	11	9	27	4.07
4	Communication	0	8	14	7	29	3.97
5	NRM Fundamentals	1	4	18	5	28	3.96
6	Quantitative Knowledge	1	2	23	3	29	3.93
7	Life-Long Learning	0	9	13	5	27	3.85
8	Writing	1	9	14	4	28	3.75
9	Diversity	2	9	11	6	28	3.75
10	Leadership	1	11	13	4	29	3.69
11	Specialization Knowledge	1	5	12	8	26	3.69

Although the scale score averages indicate overall strength in all learning outcome areas, it is important to note the breakdown of responses, specifically in the neutral and medium areas where there is less agreement. The purpose of the assessment process is to provide useful information from an industry perspective to the departments to evaluate the academic programs, strengthen the curriculum, support accreditation and assist the university in assessing institutional effectiveness and performance.

3. EMPLOYER VALUES

Employers also assessed the importance they place on each of the learning outcome areas. The ranking of the scale scores in this section may be more important than the scale score itself. The learning outcomes are ranked in order of importance from an employer perspective.

NATURAL RESOURCES MANAGEMENT		FNR	FNR
Forestry & Natural Resources		Scale Score	Employer
IMPORTANCE		Average	Importance
1	Problem Solving	4.15	4.62
2	Writing	3.88	4.59
3	Interdisciplinary Teamwork	4.27	4.55
4	Communication	3.95	4.52
5	Ethics	4.29	4.52
6	Life-Long Learning	3.89	4.18
7	Leadership	3.73	4.15
8	Quantitative Knowledge	4.00	4.14
9	NRM Fundamentals	4.02	4.02
10	Diversity	3.74	3.85
11	Specialized Knowledge	3.87	3.83

NATURAL RESOURCES MANAGEMENT		ENVM	ENVM
Environmental Mgmt & Protection		Scale Score	Employer
IMPORTANCE		Average	Importance
1	Writing	3.75	4.62
2	Problem Solving	4.07	4.52

3	Communication	3.97	4.50
4	Interdisciplinary Teamwork	4.10	4.50
5	Ethics	4.21	4.47
6	Life-Long Learning	3.85	4.14
7	Leadership	3.69	4.10
8	Quantitative Knowledge	3.93	4.07
9	Diversity	3.75	4.04
10	NRM Fundamentals	3.96	3.97
11	Specialized Knowledge	3.69	3.78

4. SALARY INFORMATION

Employers were asked to provide starting salary and salaries after 5 years of experience. The results are indicated below:

Academic Programs	Starting Salary	5 Years Experience
Forestry & Natural Resources	\$ 40,987	\$ 53,092
Environmental Mgmt & Protection	\$ 40,333	\$ 52,759

SUMMARY

REPORT SUMMARY

Career Services collaborated with the Natural Resources Management Department to design an Employer Survey instrument to assess the quality, industry readiness, performance and promotion capabilities of NRM graduates. The instrument also assessed student learning outcomes that are aligned with accreditation standards. In addition, employers were asked to assess the importance they place on the student learning outcomes. In Phase II, the employer base was expanded to include a broader range of employers and industry representatives. Employers reported the following:

- **GRADUATE QUALITY**
 Using a 5-point scale, employers reported they were satisfied with the quality of FRN graduates (4.27). Employers also reported that FNR graduates were industry ready (4.00), able to take on increased responsibilities after one year of employment (4.23), and possess the skill sets to be promoted within three years (4.33).
 Employers reported they were satisfied with the quality of ENVM graduates (4.21). Employers also reported that ENVM graduates were industry ready (3.96), able to take on increased responsibilities after one year of employment (4.25), and possess the skill sets to be promoted within three years (4.29).
- **STUDENT LEARNING OUTCOMES**
 Employers reported higher scale scores averages for FNR in ethics, interdisciplinary teamwork, problem solving, NRM fundamentals and quantitative

knowledge, with lower scale score averages in leadership, diversity and specialized knowledge and writing.

Employers reported higher scale score averages for ENVM in ethics, interdisciplinary teamwork, problem solving, communication and NRM fundamentals, with lower scale score averages in specialized knowledge, leadership, diversity and writing.

- **EMPLOYER VALUES**

Employers reported the most important learning outcomes for FNR_were problem solving, writing, interdisciplinary teamwork and communication.

Employers reported the most important learning outcomes for ENVM were writing, problem solving, communication and interdisciplinary teamwork.

- **SALARY INFORMATION**

Employers reported the starting salary for FNR was \$40,987, with a salary of \$53,092 after five years of experience. Employers also reported the starting salary for ENVM was \$40,333, with a salary of \$52,759 after five years of experience.

FUTURE PLANS

There are two future plans associated with this assessment effort.

- Phase II: The survey results will be shared with the NRM faculty and be used as a basis for curriculum review.
- Phase III: The survey will be modified to assess student perceived learning through senior seminar courses during Spring Quarter 2010. Data will be compiled along with a final report.

APPENDIX A

CAL POLY

California Polytechnic State University
 College of Agriculture, Food & Environmental Services
 Natural Resource Management Department (NRM)

Career Services
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NRM EMPLOYER SURVEY

<p>Instructions: The thoughts and opinions of our employers are important to us in evaluating the quality of our NRM programs and effectiveness of our NRM graduates. Your response will be treated confidentially. Please complete the survey for Cal Poly graduates for whom you have information. Thank you.</p>	
Name/Title	Telephone Number:
Company Name	Email Address:
<p>Please indicate the majors you hire</p> <p><input type="checkbox"/> Forestry & Natural Resources <input type="checkbox"/> Environmental Management & Protection</p>	
<p>Attainment: Indicate the degree to which Cal Poly graduates have achieved the following learning objectives: NA = not applicable, 1 = lowest, 2 = low, 3 = medium, 4 = high, 5 = highest</p>	
<p>Importance: Rate how important the following learning objectives are to your company: NA = not applicable, 1 = lowest value, 2 = low value, 3 = medium, 4 = high value, 5 = highest value</p>	

Learning Objectives – Society of American Foresters (SAF)		Attainment					Importance						
		NA	1	2	3	4	5	NA	1	2	3	4	5
1.	NRM Fundamentals - Demonstrate competency in scientific and technical knowledge related to forestry & environmental management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.	Specialized Knowledge – Demonstrate depth of knowledge, skill, and perspectives within their selected natural resource management specialization	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.	Quantitative Knowledge – Demonstrate proficiency in quantitative skills and information management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.	Problem Solving – Able to use traditional and non-traditional approaches to define a problem, identify potential alternatives, gather appropriate knowledge and information to formulate and articulate a solution	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.	Communication – Demonstrate effective speaking skills	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.	Writing – Demonstrate effective writing skills	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.	Diversity – Understand diverse perspectives and generate solutions that incorporate them	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

8.	Leadership – Demonstrate effective peer leadership	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
9.	Ethics – Understand professional and ethical responsibility as foresters, natural resource managers and environmental managers including the societal impact of FNR/ENVM	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
10	Interdisciplinary Teamwork – Demonstrate effective participation in teams	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
11	Life-Long Learning – Engage in continuous education and keep current within the field	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>

Attainment: Indicate the degree to which Cal Poly graduates have achieved the following standards:
 NA = not applicable, 1 = lowest, 2 = low, 3 = medium, 4 = high, 5 = highest

Other Standards		Attainment					
		NA	1	2	3	4	5
1.	Overall Quality – My company is satisfied with the overall quality of NRM graduates	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.	Industry Readiness – NRM graduates are able to make an immediate contribution to the workplace	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.	Performance – NRM graduates are able to take on increase responsibilities after one year of employment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.	Promotion – NRM graduates possess the skill sets to be promoted within three years	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Using the salary scale below, please indicate what you pay new graduates. Also indicate what you pay employees with five years experience. Check only the disciplines that apply.

Disciplines	\$30 to \$35K	\$35 to \$40K	\$40- \$45K	\$45 to \$50K	\$50 to \$55K	\$55 to 60K	\$60 to 65K	\$65K +
Forestry & Natural Resources <i>New Graduate Salary Range</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Forestry & Natural Resources <i>5 Years Experience Salary Range</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Environmental Mgmt & Protection <i>New Graduate Salary Range</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Environmental Mgmt & Protection <i>5 Years Experience Salary Range</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Do you have any suggestions on how the Natural Resource Management Department might improve its academic programs?

APPENDIX B

PHASE II – Employer Participation		FNR	EMP	Total
1	Applied Forest Management	1		1
2	Board of Forestry & Fire Protection	1		1
3	Bureau of Land Management, Montana	1	1	2
4	Bureau of Land Management, Bakersfield	1	1	2
5	Bureau of Land Management, Idaho		1	1
6	Bureau of Land Management, USDI	2	2	4
7	CALFIRE	2		2
8	California Forest Products Commission	1	1	2
9	California State Parks	1	1	2
10	Campbell Timberland Management	1		1
11	Central Valley Regional Water Quality Control Board	1	1	2
12	City of Glendale	1	1	2
13	Collins Pine Company	1		1
14	County of Kern, General Services Division	1		1
15	County of Los Angeles Fire Department	1	1	2
16	Davey Resource Group	2	1	3
17	Dudek	2	1	3
18	ESRI, Inc.	1	1	2
19	Green Diamond Resource Company	1		1
20	HDR/e2M	1	1	2
21	Humboldt Redwood Company	1	1	2
22	LA County Fire Department	1	1	2
23	Landau Associates	1	1	2
24	Mason, Bruce & Girard, Inc.	1	1	2
25	Mendocino Redwood Company	1	1	2
26	National Park Services, Golden Gate Nat'l Rec	1		1
27	Nevada Fire Safe Council	1		1
28	Newhall Land & Farming Company	1	1	2
29	North Lake Tahoe Fire District	1		1
30	Port of Los Angeles		1	1
31	Rainforest Alliance	1	1	2
32	Resource Conservation District	1	1	2
33	Sequoia & King Canyon National Parks	1	1	2
34	Sierra Pacific Industries	1		1
35	SLO County Air Pollution Control District	1	1	2
36	SLO County Planning	1	1	2
37	U. S. Fish & Wildlife	1	1	2
38	URS Corporation	1	1	2
39	USDA Forest Services	2	2	4
	Total Survey Responses	42	30	72