

# RANGE MANAGEMENT

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## Trends in Range Management Education

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### Highlight

This survey indicates that total enrollment and demand for range graduates are increasing. Fewer students are looking to the government for employment as more jobs in private industry become available. If the current trend continues, there should be plenty of students from range schools to fill range jobs. The range profession must act to see that all students who call themselves range men have training acceptable to the profession.

Range management is one of the fastest growing areas of biological science. Rangelands cover some 700 million acres in the United States, and the range management profession is called upon to furnish trained personnel to increase production on these lands.

During the past few years, there was a severe shortage of men with range management degrees. Frequently employers were forced to hire poorly trained men or men trained in fields other than range management. Holscher, et al. (1963) predict that the demand for college trained range men will increase throughout the 1960's. A recent report to the Society of Range Management at Wichita, Kansas, indicated that the Federal government alone hired some 100 range graduates a year. Even with the cutback in Federal employment, there is still a constant demand for range management graduates.

The Range Management Education Council appointed a committee in February 1964 to compile statistics on the availability of range management students and the trends in the supply of range management personnel from the various schools. This paper reports the findings of that survey.<sup>1</sup> It is presented to the profession in order to bring about a better understanding of the problems in range education.

Questionnaires were sent to all Range Management Education Council members asking for statistics. In addition, each RMEC member was asked to compile a list of non-member schools that offered range training in its state. All college catalogs on file at the Texas Technological College Library were searched for evidence of range training and questionnaires were sent to all schools whose catalog indicated at least one course in range management.

In addition, questionnaires

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were sent to junior colleges listed in the Health, Education, and Welfare publication of colleges teaching agriculture (Brunner, 1960) to determine if any junior colleges were teaching range management or offering pre-range management counseling.

The survey revealed that 18 institutions offered range management degrees recognized by the Range Management Education Council, 13 additional schools offered range degrees or sufficient courses in range management to meet civil service standards, 32 additional schools taught some range work, but not enough to meet civil service standards, and 16 colleges offered pre-range management counseling.

### Enrollment in RMEC Schools

The largest number of range management students are in RMEC member schools. The survey showed a total of 776 undergraduate students enrolled in curricula similar to those discussed by Heady (1961) in the 18 range schools (Table 1). Of these, there were 197 juniors and 217 seniors. Although most schools reported some freshman and sophomore students, the figures for the lower two grades do not reflect the true enrollment in lower division classes in range management. Many schools have a uniform curriculum for one or two years and the major is not designated until students are juniors. There were 100 graduate students enrolled in M.S. and Ph.D. programs at 16 of the RMEC schools.

**Table 1. Enrollment by classes at Range Management Education Council Schools during 1963-64.**

School	Fresh.	Soph.	Jr.	Sr.	Grad.
Univ. of Arizona	5	10	9	10	19
Brigham Young Univ.	17	15	8	7	2
Univ. of California	2	2	6	5	6
Colorado State Univ.	....	15	25	15	2
Ft. Hays State College	12	15	16	18	4
Univ. of Idaho	....	....	13	11	6
Montana State College	....	13	7	8	2
Montana State Univ.	....	....	8	10	2
Univ. of Nebraska	3	2	6	6	....
New Mexico State Univ.	18	13	12	14	2
Univ. of Nevada	....	1	2	1	14
Oregon State Univ.	4	3	8	5	11
So. Dakota State Univ.	....	6	3	5	....
Texas A & M Univ.	22	11	11	26	1
Texas Tech. College	11	17	18	14	6
Utah State Univ.	13	16	26	48	22
Washington State Univ.	4	4	7	4	....
Univ. of Wyoming	5	5	10	10	1
<b>TOTAL</b>	<b>115</b>	<b>148</b>	<b>197</b>	<b>217</b>	<b>100</b>

<sup>1</sup> Graduate students not reported.

Records at most institutions show that junior, senior, and graduate students eventually graduate. Therefore, only these students were used in compiling trends. Enrollment in advanced classes increased by about one-half in the last five years (Table 2). Junior enrollment increased 50%, senior 51%, and graduate 61%. Table 2 shows consistently more seniors than juniors the previous year. Likewise, the junior classes reported in Table 1 are generally larger than previous sophomore classes. These data reflect the large number of students transferring into range management from other disciplines, some even as late as their senior year. A recent graduating class of 14 range management students at Texas Techno-

**Table 2. Trend in enrollment figures of junior, senior, and graduate range students at RMEC schools during the past five years.**

Year	Junior	Senior	Graduate
1960	131	139	62
1961	132	143	64
1962	176	152	71
1963	194	171	85
1964 <sup>1</sup>	197	217	100

<sup>1</sup> Estimates based on reports of schools in April, 1964.

logical College had only one student who had started his college work in his major field. In addition, many graduate students in range management do their undergraduate work in some closely related field.

Although senior enrollment for the past 5 years was up 51%, this increase was not uniformly distributed among schools. Schools reporting a substantial increase during the past 5 years are California, 33%; Ft. Hays State College, 39%; University of Nebraska, 100%; New Mexico State University, 100%; South Dakota State College, 25%; Texas A & M University, 73%; Texas Technological College, 360%; and Utah State University, 41%. All but two of these schools are in the Plains or Southwest, where less emphasis is placed on government employment than in the mountain and far-western schools. Enrollment increases were greatest in states with relatively large amounts of privately owned land.

The majority of range graduates are produced by a few schools. One school, Utah State University, had 22% of the seniors in the survey. The top 6 schools furnished 62% of the

seniors and 10 schools had 82% of the senior enrollment.

The number of degrees in range management from the 18 RMEC member schools steadily increased during the past 5 years. A total of 643 B.S. degrees, 135 M.S. degrees, and 38 Ph.D. degrees were awarded during the period 1960-64 (Table 3). Schools vary from a high of 127 B.S. degrees to a low of 3 during the 5 year period. Six schools awarded 71% of the masters degrees, although 16 of the 18 schools offer graduate work in range management. Undergraduate degrees in range increased 48% during that time, masters degrees, 88%, and Ph.D. degrees remained relatively static (Table 4). The increase in undergraduate degrees in 1964 over 1963 was the greatest for the 5 year period.

**Table 3. Total number of degrees granted by RMEC member schools, 1960-64.**

School	B.S.	M.S.	Ph. D.
Univ. Arizona <sup>1</sup>	22	15	6
Brigham Young Univ. <sup>2</sup>	4	....	....
Univ. of California <sup>1</sup>	16	14	5
Colorado State Univ. <sup>2</sup>	74	9	....
Ft. Hays State Coll. <sup>2</sup>	57	21	....
Univ. of Idaho <sup>1</sup>	31	7	....
Montana State Coll. <sup>2</sup>	31	6	....
Montana State Univ. <sup>2</sup>	24	2	....
Univ. of Nebraska <sup>2</sup>	9	1	....
N. Mex. State Univ. <sup>2</sup>	23	2	....
Univ. of Nevada <sup>2</sup>	3	6	....
Oregon State Univ. <sup>1</sup>	10	5	4
So. Dak. State Univ.	21	....	....
Texas A & M Univ. <sup>1</sup>	80	10	6
Texas Tech College <sup>2</sup>	40	2	....
Utah State Univ. <sup>1</sup>	127	19	7
Wash. State Univ.	20	....	....
Univ. of Wyoming <sup>1</sup>	50	16	10
<b>TOTAL</b>	<b>643</b>	<b>135</b>	<b>38</b>

<sup>1</sup> Institution offers Ph.D. and M.S.

<sup>2</sup> Institution offers M.S. only.

**Table 4. Degrees granted in range management at RMEC member schools during the past five years.**

Year	B.S.	M.S.	Ph.D.
1960	106	16	5
1961	124	27	6
1962	128	33	10
1963	128	25	9
1964	157	34	8
<b>TOTAL</b>	<b>643</b>	<b>135</b>	<b>38</b>

Seven RMEC schools offer doctorate degrees in range management. Six of the schools gave from 4 to 10 doctorates. One school, the University of Idaho, awarded no Ph.D. degrees during the 5 year period. However, their doctoral program began in 1960 and they have 4 Ph.D. candidates nearing completion of their work.

#### Enrollment at Non-RMEC Schools Offering Major Work in Range Management

Not only are enrollments increasing in most RMEC schools, but large numbers of students are qualifying for civil service employment at non-RMEC schools. Civil service requirements are so low that only six hours of "range management" plus some supporting work will "qualify" an individual for range work.

Thirteen schools reported that they offered work qualifying graduates for civil service positions in range management. The amount of work in range management varied greatly between the schools. Apparently some rather strong curricula, perhaps equal to those now in the Range Management Education Council exist. Others simply offer enough range courses to qualify their graduates for government positions. Actual course offerings in range varied from the minimum of 6 semester hours to 16 semester hours (Table 5).

In all schools except one, the range management courses are offered in the home institution. Stephen F. Austin College reported that beginning in 1965 its forestry students would be sent to Texas A & M University for one semester for special training in range management. In most cases, the range courses are taught by one individual, although some schools did indicate that two or more instructors were used.

Since syllabi of courses were not specifically requested in the

**Table 5. Junior and senior students enrolled in courses leading to civil service qualification at non-RMEC schools during 1963-64.**

School	Hrs.		
	Jr.	Sr.	Range
Abilene Christian College (Tex.)	10	6	12
Arizona State College	8	6	12
California Polytechnic College (San Luis Obispo)	14	12	6.67
Humboldt State College (Calif.)	20	15	6
Kansas State College	8	3	9
McNeese State College (La.)	15	15	6
North Dakota State	....	18	12
Oklahoma State Univ.	9	9	16
Iowa State Univ.	8	8	6
Southwest Texas State	7	5	9
Stephen F. Austin (Tex.)	....	....	....
Sul Ross State (Tex.)	4	4	8
Univ. of Arkansas	2	1	6

survey, it is impossible to report subject matter coverage in the courses. Eight non-RMEC schools listed Stoddart and Smith (1955) as their text for one of the courses, three listed Sampson (1952), two Humphrey (1962), two Hitchcock (1950), and several others listed local flora or forestry texts. From the selection of texts alone, it can be assumed that course work varies greatly among schools.

The title of the degrees and the administrative department in charge of the curriculum varied greatly among non-RMEC schools. Only one offers a degree in range management. Five give the degrees in agronomy with an option in range management, 3 give degrees in forestry, 2 in general agriculture, and one each in wildlife management and botany. Six of the 13 schools are in states which do not have institutions offering a major in range management. Other schools are in states having one or more schools offering range management degrees. All except one are state supported schools.

Almost one-third of the total senior enrollment, 102 students,

meeting civil service qualifications in range management were in non-RMEC schools. The non-member school with the largest senior enrollment had more seniors than all but 3 of the member schools. Four non-member schools had senior enrollments greater than 11 member schools.

Almost all non-RMEC schools showed interest in the Council. Only 2 of the schools surveyed gave a flat "no" to the question of possible interest. Most of the schools showed interest in improving their curricula.

The 100 seniors and 104 juniors in non-RMEC schools may be expected to fill a large portion of the range jobs available. Some graduates may be well qualified; others may have received only a minimum amount of range work from a teacher who has never had a range course himself, has never conducted research in range, nor has attended a single professional meeting in range management.

Since most schools are interested in improving their curricula, there is a fertile field for the RMEC in working with these institutions. Likewise, an average of 7 new Ph.D.'s is turned out in range each year who could be used to teach in these institutions.

#### Schools Teaching Range as a Service Course

A total of 32 schools reported some range work as a service course for other disciplines (Table 6). Ten schools reported range courses taught in the forestry departments, 8 schools taught range in the agronomy program, 8 taught it as animal science, and 2 taught it as botany.

Considerable interest in the range education survey was shown by the schools offering only a single course. This interest was particularly evident among the forestry schools. Most schools not only returned the

**Table 6. Colleges and universities teaching at least one course in range management.**

Institution	Avg. Enrollment	Semester Hrs. in Range
Arizona State Univ.	18	3
Auburn Univ.	25	3.33
California Polytechnic (Pomona)	15	4
Chico State College (Calif.)	55	3
College of Southern Utah	15	3.33
Duke University	4	2
Eastern New Mex. State	15	3
Ft. Lewis State (Colo.)	15	3.33
Fresno State (Calif.)	20	3
Fullerton Junior College (Calif.)	16	4
Hartnell College (Calif.)	....	3
Imperial Valley College (Calif.)	17	3
Louisiana State Univ.	35	3
Northern Montana College	10	3.33
Panhandle A & M College (Okla.)	25	4
Michigan College of Mining & Tech.	25	3
Michigan State Univ.	40	3
Orange Coast College (Calif.)	18	3
Penn. State Univ.	25	3
Porterville College (Calif.)	10	3
Reedley Jr. College (Calif.)	10	4
Sam Houston State College (Tex.)	....	3
State Univ. of N. Y.	28	3
Texas Christian Univ.	20	3
Univ. of Georgia	40	3
Texas A & I College	15	3
Univ. of Missouri	....	3
Univ. of Washington	10	5
Univ. of West Virginia	....	2
West Texas State Univ.	15	3
Univ. of British Columbia	....	....
Univ. of Chihuahua	....	....

questionnaire, but many wrote letters explaining their offering in range. Professor George Thompson of Iowa State University indicated that he had surveyed forestry schools in the U.S. on their range offerings and was preparing a paper for the Journal of Forestry reporting his results.

Credit for service courses in

range management ranged from 2 to 5 semester hours. Many times it was difficult to tell what is taught in the courses. Ten schools listed Stoddart and Smith (1955) as their major text, 3 listed Sampson (1952), and others listed various texts in agronomy, forage crops, wildlife management, and forestry.

An average of 501 students per year are exposed to range management as a service course in schools not offering major work in range management. No attempt was made to determine the number of students taking at least one range course in schools offering major work in range management. However, it is apparent that well over 1000 students are exposed to some work in range management each year. Evidently, there is much variation in the type of work that students receive in their "range management" courses.

#### Foreign Universities Offering Range Training

Catalogs from the University of British Columbia and the University of Chihuahua indicate that courses in range are taught in those institutions. In addition, several special programs are offered in the Middle East, Africa, and South America. However, since programs in other countries are considerably different from those in the United States, no attempt was made to determine the equivalent semester hours taught.

#### Range Work in Junior Colleges

Little can be reported on range work in junior colleges. First, few of the questionnaires were returned. Second, there is no standard pre-range course such as for pre-medical, pre-veterinary, or even pre-forestry students.

Seven junior colleges teach a course in range management. Another 16 reported that they offer pre-range work. In most cases this pre-range work consists of basic science courses plus

counseling from the instructor as to the degree requirements in range management at some school with which the instructor is familiar. Many times this school may be his *alma mater* or some nearby college. It appeared that pre-range counseling was offered only where the agriculture or botany teacher was range oriented and had some exposure to the field himself.

Junior colleges offering pre-range counseling are located in 5 states: 6 in California, 6 in Texas, 2 in Utah, and one each in Colorado and Nebraska. Several other junior colleges indicated that they did not separate their pre-range students from the pre-forestry curriculum, which is much better established.

#### Vocational Training in Range

Texas Christian University has a unique program in range management. Although it offers only one college credit course in range, it has a yearly range management institute for vocational training. The program does not carry college credit, and is designed especially for students desiring a terminal program at the vocational level. Normally 20 students per year take the extensive, practical training and return to their ranches.

Several junior colleges wrote notes indicating plans for initiating two year terminal training in range management. Judging from the comments of junior colleges and the success of the Texas Christian University program, there is a need for vocational training in range for students who, for some reason, cannot take a college degree.

One apparent difficulty in the vocational approach is that it handicaps the able student who later decides to take a degree in range management. Texas schools have already encountered the problem of students transferring from the Texas Christian University with many hours of range management that

cannot be counted toward a degree. If additional vocational programs are initiated, administrators in charge of the programs must be extremely careful in their counseling in order to prevent subsequent loss of time and credit to students who may eventually continue their range work for college credit.

### Some Problems in Range Education

Range management enrollment in the United States has shown a considerable increase during the past 5 years. In addition to a 51% increase in senior enrollment in RMEC member schools, range work in non-member schools has grown steadily.

Students from non-RMEC schools now make up almost one third of the total enrollment. While many of the schools have good curricula, there is much variation in the offerings. Judging from the reported texts used in range courses, the concept of range varies from agronomy, wildlife, or forestry to that commonly held by RMEC member schools. An employer, when hiring from some schools, may not know whether he is getting a range man or a man qualified by six semester hours of something called range management taught by a professor of dairy science.

Apparently, the strong demand for range trained individuals has led to some minimal offerings and low standards. Civil service standards are set to allow maximum availability of personnel. Many times, as in the case of range, these minimum stand-

ards are below that acceptable to the profession. These minimum standards then become the maximum for some institutions seeking employment for their students.

The problem becomes more acute when the availability of qualified professors for the range programs is considered. There are 63 schools in the United States teaching at least one course in range management. Many schools have several range men on their staff. Only 38 doctorates have been awarded in the past 5 years, and only a limited number prior to that time. Research institutions compete for the terminal degree candidate. Consequently, many schools which should hire a range Ph.D. settle for an agronomist, a botanist, or a forester and the problem of range education is confounded rather than solved. Even among RMEC schools the problem is acute. The move of only one man in a key school may set off a reaction that will ultimately involve 4 or 5 schools. This demand for experienced range teachers has established a tendency in some schools offering service courses to have non-range personnel teach range courses rather than run the risk of serving as a training ground for professors in range schools.

Even though total enrollment in range schools is increasing, demand for range graduates is also increasing. Fewer students are looking to the government for employment as more jobs in private industry become available. If the current trend con-

tinues, there should be plenty of students from range schools to fill range jobs. Competition for the good student will probably increase as more private jobs become available, and the poor student may have to take a second choice job.

The large number of students from schools with apparently low standards will also be in the employment market. The range profession must take action to see that all students, regardless of school, who call themselves range men have training acceptable to the profession. This will involve education of educators themselves that minimum civil service standards are not acceptable standards for measuring a range manager.

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## Range Plant Judging Contest

Range Plant Judging Teams get ready! The contest is scheduled to be held at the Dunes Hotel, Las Vegas, Nevada, on Tuesday, February 9, at 8 A.M. Look for full details in the November Journal of Range Management.