Which Trail for Range Students?

Editor's Note: We are pleased to publish these four condensed articles on employment for range majors and graduates.

Introduction by Karl Wood, President, Range Science Education Council: At the Calgary SRM Meetings the Range Science Education Council had a program on sources of employment for range graduates other than government agencies within the United States. The many different avenues were put into four general groups of mining and energy companies, consulting, ranching, and foreign employment opportunities. An expert on each of these topics gave a presentation and submitted an article for publication Rangelands.

Employment Opportunities for Range Science Graduates in the Energy-related Fields

Clem Parkin

One of the leading questions on the mind of every college student who is investigating his educational alternatives, and those who are responsible for designing a meaningful curriculum, continues to be: Will this course of study prepare a person for a rewarding career and will there be sufficient job opportunities after graduation? Over the last several years, range science graduates have been finding employment in energy related fields. These jobs are found with state and federal regulatory agencies, such as USDI, Office of Surface Mining (OSM), and state agencies involved in oil, gas, and mining developments and reclamation. In the private sector there are employment opportunities with companies dealing with oil, gas, pipeline, mining, and electric power, as well as large construction companies and consultants working on energy development projects. The question is often asked, What does a range scientist do for one of these companies?

Demands for personnel with experience in natural resources were first noticed in the sixties and early seventies during the environmental movement which was characterized in the National Environmental Policy Act of 1969. During this time, many state governments enacted laws governing mining and mined land reclamation. By 1973, the federal government was also requiring that disturbed federal land associated with energy development be reclaimed. In May of 1976, a comprehensive set of reclamation regulations were promulgated by the U.S. Geological Survey (USGS) under 30 CFR 211-Coal Mining Operators. These regulations required operators on federal lands to "establish on regraded areas and all other affected lands a diverse vegetative cover, native to the area and capable of regeneration and plant succession, at least equal in density and permanence to the natural vegetation; ... the use of approved mixtures of introduced or native species were preferable to achieve quick cover or assure successful revegetation." Even though these regulations were amended, on August 3, 1977, the Surface Mining Control and Reclamation Act was signed into law. The resulting regulations promulgate by the Office of Surface Mining (OSM) in 1977 and 1979 built upon the language in the USGS regulation including the idea that reclaimed areas "will support the planned post mine uses of the land ...," setting minimum performance standards based on plant cover, production, woody plant densities, and plant species diversity as required to meet baseline conditions and post-mine land use. Requirements not too unlike those for coal mining have been adopted for other kinds of mining and energy development areas. It is the collection of field data, writing of permits and planning, implementation and monitoring of reclamation activities in compliance with these laws that provide jobs for range scientists. It is clear that the education generally acquired by those specializing in range science would be preferred in meeting these tremendously technical needs.

The accumulated effect of the environmental and reclamation laws led to an initially large demand for range scientists, which was exponential in nature as companies clamored to bring their operations into compliance. Like other exponential growth phases, the initial demand has leveled off and over time will exhibit both falling and rising undulations in the numbers of available jobs.

As of 1982, the job opportunities in the energy areas are relatively few. This condition undoubtedly is a reflection of the current trend in the national economy and specifically, in mining and energy fields where there have been cutbacks and in some cases, closures of uranium, coal, and molybdenum mines; oil and gas exploration is not as speculative as it has been. The projected oil shale development and growth, which created an aura of job security for many years to come, has likewise experienced cut backs and closures. Consequently, competition is high for the few jobs that are available. The next question is, How about future opportunities and what can be done to enhance the possibility of getting a job.

Speculation on future job opportunities, for the most part, is optimistic and could possibly precede improvements in the national economy. It is generally agreed that the demand for range scientists will never equal that of the last ten years. In the immediate future there should be some increase in job opportunities associated with the abandoned mines pro-
Funds for this program will not be affected by recent cuts in federal spending.

The possibility of obtaining a job can be enhanced by additional classwork and specialized summer work experience. If a student is interested in working for a mining company, it would be desirable to have taken a basic course in mine engineering, or similar courses, or at least have educated himself in the rudiments of mining before interviewing for the job. A student who has done his homework in this regard will often make a better impression in an interview as well as being better prepared to function in the position. Extra coursework in soils, agronomy, or even business for those with an interest in administration, would be useful.

Some universities are now offering a reclamation option to their range and other science curriculums. This appears to be a good way to educate students wanting to get into the energy field from the standpoint that the student will qualify for the civil service register and other range related job alternatives and still meet specific needs of the energy industry. At a time when jobs are hard to find, graduates need to have as many alternatives available as possible.

In summary, there are currently few jobs available for which there are many applicants. This situation should improve in the long run, with the improvement in the national economy. Range Science is a valuable education for students wanting to get into the energy field and can be augmented by additional technical classwork or where possible, a minor in reclamation.

Consulting activities in the private sector include such assignments as AID projects in other countries, ranch management (planning and project design), expert witness services in legal cases, mine spoil reclamation, assisting livestock operators and other user groups in their dealing with government agencies, and advising financial institutions on management of their range holdings. A good ranch manager may need the services of a range management consultant as he would those of a veterinarian or banker, depending on the degree of problem he faces. These managers recognize the value derived from such a specialist who is abreast of the latest developments in his speciality. When it comes to range and pasture management on private lands, some kind of technical assistance from the Soil Conservation Service and State Extension Service has been free. However, some ranchers have found it desirable to engage a reputable consultant to augment such assistance because the private consultant is able to devote more time and expertise to the rancher's explicit problems.

Absentee ownership of ranches and ranches purchased by inexperienced investors desiring to change to a ranching lifestyle creates opportunities for range management consulting. The volume of work available through mine spoil reclamation probably will fluctuate with the economy and energy demands. This latter market may be already saturated.

The future of range management consulting in regard to public lands looks brighter than it has in the past. A consultation with the Oregon State BLM office and Regional U.S. Forest Service office confirms that there is no policy in either agency that prohibits or discourages the use of consultants to accomplish specific projects. Personnel ceilings of agencies are not affected by use of consultants. Other agencies which have used consulting services are Bonneville Power Administration, Bureau of Indian Affairs, and the Army Corps of Engineers. Declining budgets and reductions in personnel, coupled with the recently expanded requirements for resource assessment, inventory and monitoring which are mandated by recent Acts, suggest that the use of range consultants may be the judicious way for agencies to use the limited amount of available money.

In spite of favorable agency policies, the people in these agencies must believe that outside consultants can provide an efficient alternative to existing methods of doing business. At the present time the Forest Service and the BLM have used consulting services to a limited degree and more in some regions than in others. Obtaining clearance to use consultants is not easy; in the Department of Interior contracts involving over $10,000 require Departmental approval. Some agency personnel are biased against the use of outside consultants. The authors feel it is time for agencies to objectively consider the use of consultants for specific assignments as an efficient alternative to relying solely on agency personnel. Range consultants may realize that they have a critical role in their own future. Each performance that is unsatisfactory in the view of the contracting agency will undoubtedly create adverse reactions toward consultants generally.

Although this summary is deliberately optimistic, opportunities for consulting in range management are not plentiful. Certainly, any graduating student realizes the futility of setting himself up as a consultant in competition with thoroughly experienced, well-known professionals who are already established. The best option for the graduate is prob-

Non-government Employment Opportunities—Consulting

E. William Anderson and Glenn Adams

In the past few years range management consulting activity has increased markedly. This activity will likely continue to increase for some time to come.

As the general public, private land owners, and public land managers become better informed as to the economic and social importance of the range resource, range management consulting service will become more common. In retrospect, it appears that increasing opportunities for range management consulting began with the National Environmental Policy Act of 1969. This Act forced resource-based industries and agencies to become more aware of the environmental aspects of their actions and this awareness has been growing.

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ably to become hired by an established consultant or consulting firm as a technician. A partial list of range management consultants and firms, which was assembled with the help of range management consultants in the West, is available to give students a lead on where to inquire as to job opportunities.

Ranch Employment Opportunities

W.T. Hamilton

Introduction
At any point in time the following areas are helpful in assessing ranch management employment opportunities for range graduates: structure of the range/livestock industry, ranch owner needs, student qualifications, and industry economics. However, these are dynamic areas, subject to changes that in turn will influence future job opportunities. The impact of such changes in the nature of traditional ranch ownership and organization, diversification and integration of resources uses, and new range, animal and other technologies remains to be seen. I hope it is a positive one.

Structure of the Industry
Boykin, et. al (1980) partitioned the continental U.S. into five cattle-raising areas. The Southwest region (Arizona, most of New Mexico, Oklahoma, Texas and portions of Louisiana and California) contains 270 million acres of land used as pasture and rangeland and accommodates about 16 million animal units of grazing annually. This region would seem to serve well for structural analysis of the range-livestock industry, as it has characteristics of all other production regions, including enterprises that are predominately public land, as well as private land operations.

In 1974, more than 173,000 farms and ranches reported 9.2 million beef cows located within this region. These amount to 18% of the total farms and ranches and 23% of the total beef cows in the nation. Most importantly, however, 74% of the region’s farms and ranches with beef cow had fewer than 50 cows, and only 4.3% had herds of 200 cows or more.

Some intensive operations of <200 head hire “ranch managers,” but the greatest potential for employment remains with the relatively few large units. Boykin (1980) indicates that even these larger units do not all report the use of hired labor. It could be assumed that fewer still would employ management personnel, and that annual job availability would be largely subject to turn-over in current employees.

Range graduates interested in these positions would be competing among themselves from within and outside the region, as well as with animal scientists, agricultural economists, wildlife biologists, and graduates of farm and ranch management schools, and others, such as ranch-raised people who have pursued degrees in business management and other disciplines. I expect competition to remain keen for such jobs.

Ranch Needs
Ranch enterprises are still, for the most part, entrepreneurships which are organized and managed by the man who assumes the risks of the business. His objectives and perception of needs are as independent and prevailing as they are variable among his peers. However, if there is a single, most conspicuous criteria used in hiring people for ranch management jobs, it has been on-ranch experience.

Ranchers are hesitant to hire people who have no track record of day-to-day operations in a range-livestock enterprise or reasonable facsimile, such as a stock farm or cattle feeding operation. The ability to repair windmills, build fences, weld, work livestock, run equipment and many other routine aspects of running a ranch are prerequisites not normally met in the formal education a young person may have in the principles of range, livestock, or wildlife management. A superb education in the management of range resources is diminished in the job market without hard evidence of the ability to effectively manage livestock and conduct other ranch operations.

I believe that ranch employers want generalists capable of dealing effectively with the wide array of challenges imposed on ranch management. There is evidence of an increasing concern over business management, economic analysis, and effective planning of the enterprise. It is rare that ranch employers are large enough to hire management level specialists in any one area of production. Undergraduate curricula that become too specialized in any aspect of resource management exclusive of the animals or alternate land uses are not that attractive to potential ranch employers.

Student Qualifications
If it is accepted that lack of experience base is a primary limitation to graduates in competing for ranch management jobs, programs which incorporate experience with course work are important. Cooperative Education which integrates on-ranch work experience into the undergraduate degree program is promising. These students are able to accrue at least a year of experience prior to graduation. Perhaps as important as this level of experience are the contacts made in the industry during the process. Many other students avail themselves of summer ranch employment as a self-help means of gaining ranch work background.

At Texas A&M increasing numbers of students who finish undergraduate degrees are entering graduate programs designed to produce potential professionals in ranch management and other fields. We call this program the Master of Agriculture degree and it is designed to provide a tailored, broad-based graduate level education of interdisciplinary course work and a professional internship in the industry. We have had good success with a limited number of students who have used this graduate degree program to enter ranch management jobs.

Industry Economics
Ranch owners are not unlike other businesses in that they resist adding those positions which are a direct cash cost to the operation. Many owners receive their “pay” from the operation as a return to their labor and management, which is a non-cash expense. The range-livestock industry is currently in an economic framework where costs of production are greater than income in many parts of the country. In such a tight economic environment adding permanent labor of
any kind may be the least likely decision a rancher would make.

On the other hand, economic "crunch" may serve as an incentive to some enterprises to add management expertise as a means of improving economic performance. Still, it is probably safe to assume that the overall influence of poor economic environment will serve to suppress employment opportunities.

Summary
Although the range-livestock industry is large in the southwestern U.S. and employs many people, the structure of the enterprises actually presents limited opportunity for employment of management level employees. "Hands on" experience in ranch operations is a strong requirement among employers. Hired labor represents a cash expense to ranchers and is avoided, particularly that of a permanent nature and in time of economic depression.

Those students who have ranch backgrounds will be most employable, while those from urban backgrounds can enhance their employment potential with a concerted effort of ranch work experience through cooperative education or summer work. Professional graduate studies which emphasize ranch management and include an internship in the industry will give students a superior chance of employment after graduation.

An increase in the intensity of ranch operations requiring greater technical skills may, over time, create an increased demand for managers from university programs. That part of these jobs filled by the range graduates will likely be a function of individual experience base and the quality of the degree as assessed by ranchers, as well as economic climate of the industry.

Literature Cited

Foreign Employment Opportunities

G.F. Gifford

At the present time employment within the range profession in a foreign country ranges all the way from involvement with development-type projects (resource inventory, mapping, initiation of grazing systems, development of stock water, establishment of grazing reserves or drought reserves, etc.) to projects that involve some aspect of education, extension, or cooperative research. On some projects educational aspects interact with developmental phases.

Assuming that other universities are similar to the Utah State University (USU), the opportunities for foreign involvement are increasing. The Range Science Department at USU is currently involved in projects in Brazil, Morocco, and Somalia. All of the projects are in some way related to education and training, extension, or they involve cooperative research. As a faculty we have decided that any eventual long-term management access within a foreign country is going to depend in large part on the availability of educated indigenous range professionals. Therefore, we have elected to pursue only those projects which contain an educational phase. Portions of our ranch curriculum are being revised to help meet those objectives for foreign students attending USU. Currently we have students from 8 countries at the B.S. level and from 15 countries at the graduate level.

For those wanting to be involved in a foreign assignment, the following may be worth your consideration:
1. For most development and educational type projects practical experience is of utmost importance. Experience gained from a foreign assignment is also valuable, as are speaking and reading abilities in the respective native tongue. Most educational programs require PhD degrees plus experience, especially at the university level. Graduating students can obtain experience by accepting support-type positions on foreign projects or through organizations like the Peace Corp. If you are new to international assignments, prepare for a cultural shock. New graduates, undergraduate or graduate, will not be hired as project leaders. They can, however, be valuable additions to any project and they may contribute significantly to the success of the project. Because of the extreme difficulties encountered in accomplishing anything significant on development-type projects, a generous dose of optimism is a prime requisite for a successful assignment.
2. If you are a faculty member, and especially if you are not tenured or are something less than a full professor, and your prime responsibility is teaching and research, a foreign assignment will do little in terms of professional advancement. This does not include short-term consulting. In fact, especially early in one's professional career as a teacher or researcher, a long-term (2 years or more) foreign assignment may be lethal.
3. Keep resumes current with various universities and consulting firms. New opportunities are always in the making and personnel turnover rates are often high.
4. Salaries are usually excellent on foreign assignments and current tax laws provide for no income tax on the first $75,000 of salary providing you meet IRS rules for being abroad over a 12-month period.
5. Students interested in international assignments should definitely take international-related range courses, one or more extension courses, one or more international flavored sociology courses, and perhaps French and Spanish as part of their range program. Sociological factors are extremely important in the delicate process of technology transfer.
6. And finally, short-term consulting assignments will be a function of your accumulated experience and availability.