

THE PROFESSIONAL NATURAL RESOURCE MANAGER: TRAINING IN THE UNIVERSITY

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INTRODUCTION

The following is not intended to be a comprehensive review of existing curricula but a series of personal impressions, somewhat biased towards the wildlife profession and towards the Forestry and Resource Management program at the University of California, Berkeley. I have recently been involved in a reassessment of the Forestry and Resource Management curriculum involving 40 faculty and dozens of alumni in preparation for accreditation by the Society of American Foresters, and in preparation for a switch from the quarter system back to the semester system.

WHAT IS A PROFESSIONAL RESOURCE MANAGER?

Before one can discuss training needs, one must have a clear idea of what the training will be used for. What is a "professional, renewable natural resource manager"? A professional is generally thought to have the following characteristics:

- 1) Through initial intensive training and continuing experience the professional has gained specialized technical abilities for solving significant social problems.
- 2) The professional has an ethical outlook in that he or she is dedicated to uphold a specific code of personal behavior. Such codes are generally couched in terms of benefiting mankind in general, even if at the short-term expense of the professional. For example, a medical doctor, having taken the Hippocratic Oath, is expected to assist an injured skier even if it disrupts his or her own ski trip.
- 3) Because of human frailty there is a need for checks on performance to which the professional willingly submits. This is generally accomplished by peer review via licensing, certification or a similar process.
- 4) Because a professional allows himself or herself to be accountable to the public, and because he or she is more or less skilled at solving greater or lesser social problems, the public shows its acceptance of and confidence in the professional with appropriate monetary remuneration and social status. Most medical practitioners, lawyers, or engineers receive higher salaries and more respect than do contractors or pest control operators. In the final analysis, public acceptance is probably the most important measure of professionalism.

What is a renewable natural resource manager? I will not elaborate on the concept of renewable natural resources other than to indicate that I consider wildlife, fisheries, range and forest resources, among others, to be included.

What is a manager? The archaic meaning of to manage is to "put a horse through its paces". This concept has now been extended to involve the control or guidance of anything for a purpose. Thus a resource management system must include four components:

- 1) Goals must be established, often elaborated on by a set of policies.
- 2) There must be a resource, typically embedded in an ecosystem. Incidentally, I like to consider humans as being included in the structure and function of ecosystems.
- 3) There must be some means of monitoring the ecosystem to provide the negative feedback required for the regulatory process. I consider any knowledge-acquiring activity, including research, as monitoring. Thus monitoring in the general sense also provides the feedback required for reassessing the management goals.
- 4) There must be some means of manipulating the ecosystem (including humans) towards the stated goal. It is my observation that most practicing managers mistakenly equate the terms management and manipulation, overlooking the importance of setting clear goals and monitoring results. Any manager must have some understanding of all four components of the management system to be an effective decisionmaker.

Although some of us call ourselves biologists rather than managers, I think most of us would agree that even though we may have been formally trained in an environment of "biology for the sake of biology", we now have a management perspective. Although we may influence management decisions only as advisory staff, we are certainly concerned with the decisionmaking process. Thus, for purposes of this talk, I am equating the staff biologist with the resource manager.

TERTIARY EDUCATIONAL NEEDS

There is a running debate within all professions regarding appropriate higher educational requirements. As human knowledge in general expands, there is a tendency to pack more and more material into the curriculum. One issue then is, how many years should one allocate to the university experience? In my opinion a professional resource manager should have at least one year of schooling beyond the bachelor's degree, or five years of university education in total.

A second issue that might be raised at this point is that of continuing formal education. It is often said that after a decade on the job, if people have made no effort at updating their education they could expect to start all over again if they returned to their alma mater. Present courses in subjects such as genetics, physiology, and especially ecology, not to mention economics, sociology and psychology would bear little resemblance to those taken ten to twenty years ago. My brother graduated from medical school only six years ago, yet he voluntarily spends one to two weeks per year in formal courses and seminars, all at his own expense. Such a commitment is not unusual in the medical profession. You may find it noteworthy that of the group of five doctors in my brother's practice, one individual has fallen considerably behind in his knowledge of current practices. He was recently asked to leave the practice by the other four doctors.

One can propose curriculum content on the basis of the skills required as suggested by my previous description of a management system. Basic to any higher education is the attainment of the ability to communicate effectively. How to read, write, speak and listen are all necessary skills elaborated on by other panel speakers so I will not belabor them. An idea in one's mind is of little value until it can reach another mind.

In my opinion there are too many resource managers attempting to practice their profession without a solid, balanced background in the basic sciences. Most of the baccalaureate degree should be comprised of such courses. To understand the structure and function of natural systems one needs to comprehend the basic principles of physics, chemistry, geology, zoology, botany, genetics, physiology, and ecology. It has been suggested that one of Aldo Leopold's contributions was to have translated the ecological theories of his day into practical guidelines for the practicing wildlifer. I wonder, were he alive today, if he would be satisfied with the gap between theoretical ecology and current wildlife management practices. Similarly, to be able to work effectively within the context of human institutions, one needs to appreciate the major aspects of politics, sociology, psychology and especially economics. Finally, the quantitative techniques of algebra, calculus, statistics, and computing are essential requirements for the efficient

manager in today's world. All of these subjects can be taught in a resource management context, by and for resource managers. This would certainly make the courses more "interesting"; however, in most cases students will need to obtain the basic theory where they can and transpose the concepts to familiar examples.

I mentioned that manipulation and monitoring are essential components of a well regulated management system. Training in these "applied" skills should of course build on the basic sciences. While some applied courses may be taken prior to obtaining the bachelor's degree, many would necessarily be obtained at the graduate level. The details of this portion of the curriculum should vary depending on the degree of resource specialization. For example, multiple use planners may take a generalist strategy while a waterfowl manager may specialize to a considerable degree. As a rule I advise students to consider at least two fields, such as wildlife and range management. In any case, applied ecology, applied economics, and resource policy should be included in addition to the many manipulation and monitoring techniques specific to each resource specialty.

There are two additional educational experiences that I believe are essential for professional resource managers. These are: 1) field instruction and 2) a consideration of professional ethics.

Most universities attempt to provide field instruction during laboratory sessions or even summer camps. Many also assist students in obtaining relevant summer employment. However, many if not most students entering the natural resource field today are urbanites. At best they have been hiking or camping. A student that has grown up on a ranch, in a logging camp or on a game preserve has a real advantage in that he or she is likely to already be familiar with many resource management issues and techniques. However, even these students need help in learning to "read the land". By this I mean the ability to quickly assess a landscape and its resources and prescribe an appropriate program to meet perceived objectives. To achieve this art, one must have practical training in the field. In my opinion only a fraction of resource managers are skilled artists at reading the land and prescribing effective management programs.

Lastly, few public schools are comfortable with the idea of courses on ethics and morality. However, I suggest that more than a few of the resource management controversies within and between various agencies and enterprises have been a result of the naivete of managers regarding their roles on the job. Examples include the manager in a public resource agency who acts simply as a special interest activist, or the staff biologist in a private enterprise who rubber stamps all development projects without critical review. I suggest that the subject of professional ethics can best be handled at the graduate level, in a case history, seminar format, taught by an elder statesman. The objective of such a course would not be for the instructor to indoctrinate the students with a particular ideology, but to raise and discuss issues and situations likely to be encountered on the job. This would allow each student to consider his or her own beliefs and probable reactions in a relatively benign situation without the stress of a real life confrontation.

WHERE DO WE STAND?

In conclusion, I ask you, how do you think the public rates renewable natural resource managers as professionals? Does it believe we are technically skilled? Does it believe our predictions? Do most students entering the field expect to compete with medical or engineering students in basic science courses? Do these students appreciate the importance of economics and policy courses? Do they realize the importance of developing their field skills? And finally, does the public believe we are working in its best interests? Do students entering the profession not only have the necessary technical skills, but a thorough comprehension of their role in society and the institution in which they may be employed?