IDAHO FORESTER 1975

PUBLICATION OF THE STUDENTS OF THE COLLEGE OF FORESTRY, WILDLIFE and RANGE SCIENCES, UNIVERSITY OF IDAHO.

The forest of 2001.

Simpson

Tree farmers since 1890.

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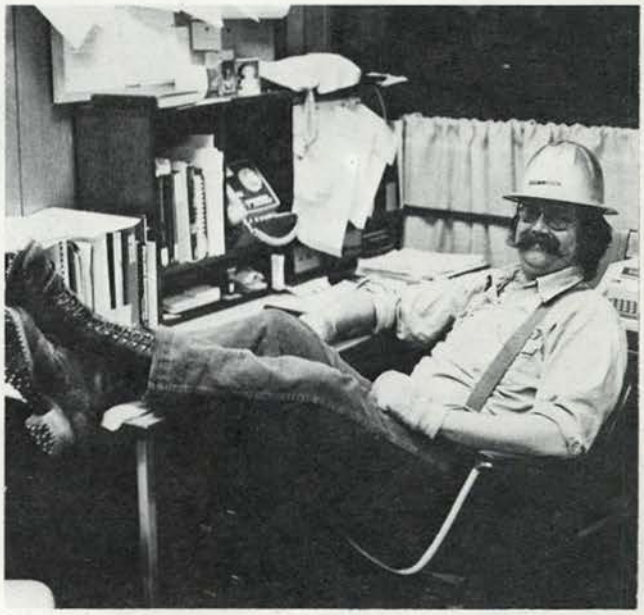
Editorial



Al Merkel, Editor

"To waste, to destroy, our natural resources, to skin and exhaust the land instead of using it to increase its usefulness, will result in undermining in the days of our children the very prosperity which we ought by right to hand down to them amplified and developed."

Theodore Roosevelt, December, 1907

The ideas expressed in these words are even more meaningful now than when President Roosevelt said them over half a century ago. Our resources are now at a point where conservation is no longer an exercise in intellectual forecasting, but necessary for survival.

What we should do and how to do it are burning questions in the minds of the students in the college today. Our education will only partially answer these questions. It will give us direction on the path of solution, but the solutions must be ferreted out.

The theme of this year's **Idaho Forester,** integrated land management, is one method that may answer these questions. Modern land managers, such as Weyerhaeuser, are realizing the folly of making silvicultural decisions without consulting the wildlife biologist, entomologist, soil scientist and many others — hence, integrated land management. This approach, while new to some, may be the only acceptable one in the future.

Many articles in this issue reinforce this concept. Some examine the theory of integrated land management, some deal with techniques which characterize integrated land management, such as the article on modeling and simulation.

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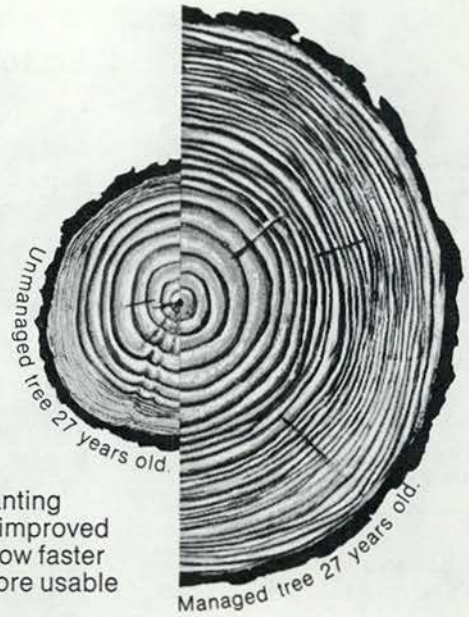
Scientific growth.

Another reason
Georgia-Pacific's natural
resource is growing
more important to you.



As the world's natural resources dwindle, more and more demands will be made on the forest. Nature, without man's help, takes more than an average lifetime to grow a harvestable forest. But G-P has cut that time in half.

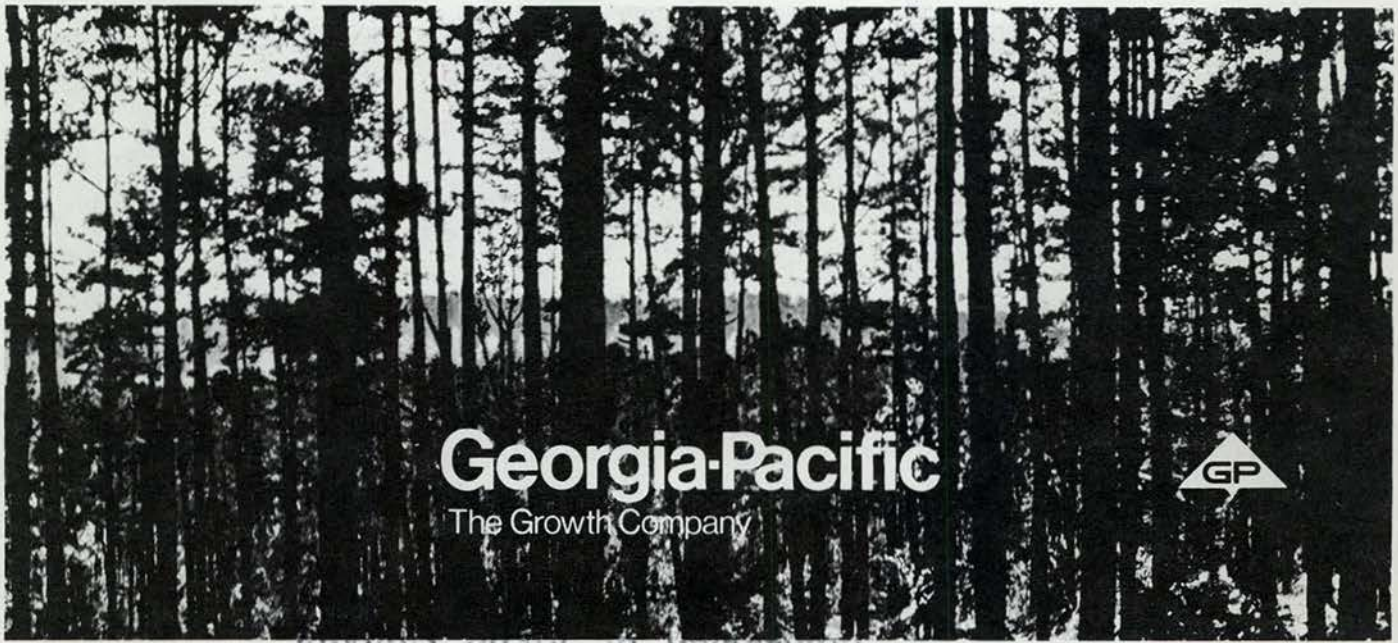
We're planting genetically-improved trees that grow faster and have more usable wood fiber.

In addition, we're helping speed the growth of the forest through our timberland management program, which includes thinning, removal of competing underbrush, application of fertilizers, and other techniques.

Georgia-Pacific now owns 4.5 million acres of timberland. We also have exclusive cutting rights on 1.5 million additional acres, bringing our total to 6 million acres. And we're making G-P land more productive; our resource more plentiful and valuable. Scientifically.

Send for a free copy of TO GROW A TREE and MATTERS OF PUBLIC CONCERN. Write: Georgia-Pacific Corporation, 900 S.W. Fifth Ave., Portland, Oregon 97204.

Southern Pine



COLLEGE NOTES

THE DEAN'S MESSAGE

The theme of this year's **Idaho Forester** — integrated land management — is a timely one. The importance of land management to Idaho cannot be overemphasized.

There is no doubt that our demands on forest and range lands will continue to escalate in future years. And land management, or the lack of land management decisions today will determine the productivity of these lands for tomorrow.

Idaho has a wealth of natural resources associated with its millions of acres of forest and range lands. These lands support two of the states most important industries — timber and livestock. In addition, these lands attract thousands of visitors each year for hunting, fishing and vacations.

Other benefits from Idaho's wildlands are less apparent, yet equally important. The state's water resources originate in wildland watersheds. Idaho's water potential may prove to one of the state's most coveted, and controversial, assets.

Finally, the quality of life in Idaho is related to its wildlands. The character of Idaho, perhaps more than any state besides Alaska, can be described in terms of a unique inheritance of wildland resources.

I believe the future of Idaho is in its natural resources, and that the land management decisions made in the next few years will heavily influence the state's development.

Management Decisions

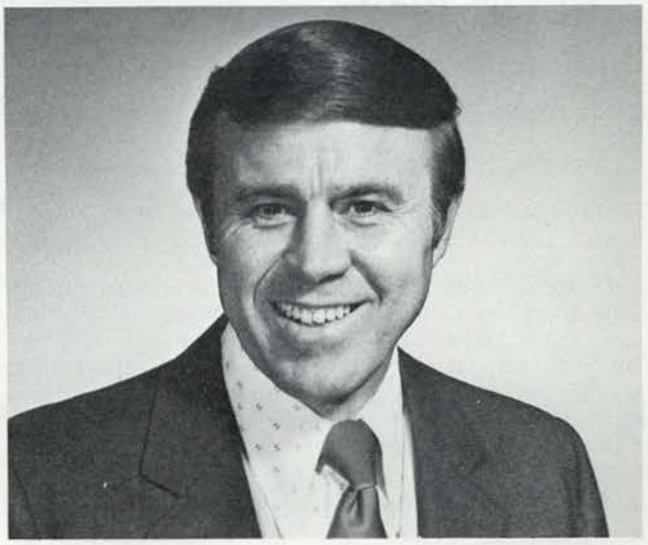
Who makes these decisions, and how are they made? In Idaho, a large proportion of the state's forest and range lands is federally administered, so decision making becomes a process which takes place systematically and involves a lot of people. The list includes commercial and special interest groups, agency personnel from the district level to Washington, D.C., personnel from **other** agencies, "the public" and our legislators.

Management on private lands may be more expedient, because the goals of management and the number of people involved in decision making can be more confined. Yet even management of privately owned lands is influenced by public pressures in the form of laws, such as air pollution regulations, stream protection laws, even zoning and land use classification.

Successful management on both public and private lands has to be based on scientific information about the resource, and on knowledge of social needs.

Integration

Research provides the scientific basis for land management decisions. Management not based on knowledge of the physical and biological environment can result in ecological disasters — rangelands depleted by overgrazing, polluted watersheds, destruction of wildlife habitats, poor regeneration of forest stands.



John H. Ehrenreich

Conversely, natural resource management dictates the direction and emphasis of research in the College of Forestry, Wildlife and Range Sciences at the University of Idaho. The whole theme of the FWR Experiment Station is integrated land management. And I believe that theme dictates the need for "integrated research."

Let's look at why that word "integrated" is so important in both natural resource management and research today.

If you were to ask the man on the street to define the word "ecology," I'd be willing to wager that, although he may not rattle off the scientific or dictionary definition of the word, he will give you an answer that reflects his understanding of the basic principle of ecology — that all elements of our environment are interdependent.

He will probably also know that if one factor in the environment is altered, other changes will occur as the system re-established an equilibrium.

The degree of emphasis placed on integrating ecological principles into natural resource research and management today is unprecedented. And one of the reasons for this emphasis, I believe, is an ecology-minded public.

The Public

When I refer to an ecology-minded public, I don't mean just backpackers, wildlife enthusiasts, conservationists or Sierra Club members. I am including people who have commercial interests in forest or range resources — the forest industries, mining companies, livestock ranchers, wetland farmers.

All these interest groups recognize that forest and range lands cannot be managed for a single use without examining the impacts of that use on other uses and values. The same ecological principles apply whether on wilderness lands or intensive culture lands.

How does this attitude come across to Steve Symms or Frank Church in Washington, D.C.? Differing interest

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"In short, I feel much more in charge of providing for my own well-being. And walking through a wilderness and seeing all the beauty there somehow means more to me than passively sitting in front of a television set."

STUDENT INPUT

Betsy Brown

Ed. Note: Betsy is a freshman in wildland recreation.

There are several reasons why I chose to go into the forestry program at the University of Idaho.

There are some things that I don't particularly care for about living in a modern society. In the winter, if I'm cold, I can go inside a heated building and turn a knob on a thermostat to keep warm. If I'm thirsty, I go turn another knob to get water. When I'm hungry, I've had food given to me, completely prepared, first by my mother and then by the cook in my dorm here at school. I'm very insulated from the processes of nature.

Well, I've been a Girl Scout since I was seven. I never liked selling cookies, but I found out that I really like camping. When I am living in the woods, I feel more alive and more independent.

If I'm cold, I must depend on my ability to build a fire or dress myself properly to keep warm. If I can't find a spring, I'll just go thirsty. I provide my own shelter. (Well, I didn't make the tarp I sleep under, but putting up a tarp takes more skill than walking in the door of a building someone else built).

In short, I feel much more in charge of providing for my own well-being. And walking through a wilderness and seeing all the beauty there somehow means more to me than passively sitting in front of a television set.

I think people gain a great deal from the opportunity to live in the wilderness. But the way things look now, there won't be too much left for anyone to enjoy if care isn't taken to keep the wilderness from being destroyed or turned into a series of gigantic tree farms.

So I would like to help preserve some of the wilderness we still have, and help see that other lands are managed properly. I think that getting a FWR degree, probably in wildland recreation, will help me to do that. And that's why I'm here.

Ross Applegren

Ed. Note: Ross is a senior in forest resource management.

Any integrated land management decision involves numerous less complicated decisions within specialized fields: silviculture, hydrology, pathology, logging and road engineering, and soil science to name a few. The person or persons using these decisions and other pertinent information to formulate management goals must rely on the expertise of the specialists with whom they work to supply complete and accurate information.

Those persons making the integrated land management decisions must be Jacks-of-all-trades. They must synthesize information from the various disciplines and come up with a workable management scheme.

The use of integrated management within the timber industry, whether implemented by private industry or a government agency, indicates that there is concern for the future forest and its potential for growing trees. In my opinion, the most important area of concern is to preserve the land base in a sound timber growing condition.

The land is the basic resource from which our forests grow, and thus it should be given primary consideration in any land management plan. An integrated land management situation is particularly suited to give such consideration since experts in many fields are available for advisement.

Logging and road engineers can have the greatest effect on the land and its capacity to grow trees. These engineers, working with hydrologists and soil scientists, have the combined skills to keep to a minimum damage to the land which often results in soil loss and eventually reduced yields. The consideration given to the land base is essential to long range forest management (4, 5 and 6 rotations).

My degree has provided me with a level of competence in forest management of which I am proud. It has given me a working base of subject matter and skills which I may be challenged to use in future job situations. It has also given me, in a general sense, the ability to meet the challenges that an integrated land management policy presents to a forester.

Yet, the basic skills and knowledge I obtained in the College of Forestry, Wildlife and Range Sciences must be further developed and enhanced through work experience before I can obtain the competency that is demanded in formulating integrated land management plans.

I also feel that my introduction into the other majors within the College of Forestry, Wildlife and Range Sciences, such as range management and fisheries management, have given me a background that will prove valuable if these fields are to be considered in the integrated management of a forest.

Tom Miller

After graduating from the University of Idaho College of Forestry in 1971, Tom worked for the Peace Corps in Honduras for two years and was then employed by a commercial concern in Alabama for one year. He is now a graduate student in forest ecology here at the University of Idaho.

It is a difficult task to quantitatively evaluate the impact my undergraduate education at the University of Idaho has had on my personal ability to initiate and implement land management programs. However, three years of job experience has given me an adequate perspective to develop a very qualitative feeling about the degree of preparation this college imparted to me concerning integrated land management.

In retrospect, I feel strongly that the college tried to give me an exposure in two different broad areas of education. The first area I call a technical education, with emphasis on the actual performance of field assignments. The second area I call a theoretical education, with emphasis on having knowledge of methods of natural resource management and the implications

of land management programs. These two types of education have proven to be important in my job experiences both in the United States and abroad.

I feel that the technical aspect of my education has given me the necessary confidence to perform basic field management operations such as cruising, surveying, photo-interpretation, habitat-typing, etc. It has also allowed me to adapt quickly to the many methods or procedures employed by different land management groups.

The feedback I gathered from my employment and in job interviews is that employers expect a certain degree of ability to perform field functions before credibility as a land manager can be established. Success in implementing other land manager's programs provided opportunities to initiate personal programs.

The college seems to be as involved in discussions concerning the merits of this technical side of education as it was during my undergraduate years. Although the locality, timing and degree of exposure to field application of land mangement techniques may deserve revision, I feel that this phase of education should be maintained.

Employers are obviously interested in more than just the ability to perform basic field assignments. Technicians would well meet this requirement. People with the ability to initiate integrated land management programs are of utmost importance to employers. This is where the second phase of undergraduate education should provide the potential natural resource manager with an insight into all the considerations important to developing integrated land management programs.

In this area of education the college gave me a small taste of the problems other branches of natural resource management, such as range, wildlife and wood technology, must consider and the solutions these branches had to offer. The approach of presenting piecemeal (Elements of Range Management, Elements of Wildlife Management, Elements of Fisheries Management, etc.) the different phases of natural resource management was helpful in providing some idea of the many considerations pertinent to any land management decision.

However, the lack of any course which scrutinizes land management decisions with **simultaneous** input from the many facets of natural resource management presented a gap in my education. As an undergraduate I had a definite feeling of polarization among the different "options" in the college and to a lesser extent, I have the same feeling today.

Forest managers think of themselves as only forest managers, wildlife managers as only wildlife managers and wood technologists as only wood technologists. To me this represents more than friendly rivalry among people with different interests. It is more a result of a lack of emphasis that land management problems must be analyzed from the standpoint of all aspects relative to the desired objectives. Exposure to the different areas of land management without a series of courses designed to synthesize these different phases created a weak point in my education.

It is impossible for an educational system to meet the requirements of all the people involved with it. I rate my education as very good in comparison with other institutions and feel that it has adequately prepared me to work in the land management field. The presentation of both technical and theoretical aspects of land management was very useful. However, increased emphasis on the importance of considering all aspects of land management would have been very beneficial to me in relating the concepts necessary for integrated land management to my job assignments.

REMOTE SENSING

There is a new teaching and research program at the college this year—remote sensing and aerial photo interpretation. High enrollment in the first offering of courses in this area indicates a need for the subject and a genuine interest from students. The photo interpretation laboratory is of particular interest, because it is equipped with six slide-tape audiotutorial machines and is available to the students at their convenience.

For those of you unfamiliar with remote sensing, the term refers to a system of collecting data about natural resources with the collecting sensors at some distance from the resources. Examples include animal tracking via radio, aerial photography, thermal and multispectral scanning, and side-looking airborne radar.

At present, the college is in the process of acquiring aerial cameras and film processing equipment and is changing the present darkroom to do color developing and printing. A new $30,000 aerial camera, acquired from surplus military equipment, was shipped to the college in February. A four-channel image combiner, obtained by Drs. Tisdale and Hironaka for their Earth Resources Technology Satellite (ERTS) study, is being modified to allow enhanced color enlargements to be made for graduate and research studies. The university has access to a local aircraft, equipped for high altitude vertical photography, which will be used in conjunction with all studies.

A Remote Sensing Research Unit is being established at the university to coordinate research, teaching and service for

the university community and interested state agencies. W. B. Hall, professor of photogeology in the College of Mines, and R. C. Heller, professor of remote sensing in the College of Forestry, Wildlife and Range Sciences, will act as coordinators for this unit.

Several remote sensing research proposals have been generated between the college and outside agencies, such as the Forest Service, State Water Resources Board, Pacific Northwest Regional Commission (Land Resource Inventory System) and the Soil Conservation Service. We expect that some of these proposals will be funded this winter and permit us to start the remote sensing research program. Such a program should provide technician employment and several research fellowships for graduate students.

CLUB SANDWICH

Forestry Club

The Forestry Club was organized during the fall of 1973 by members of the Student Chapter, Society of American Foresters. It was felt that the S.A.F. was not flexible enough in providing social and other "out in the woods" activities. The newly-formed club was designed to meet these needs, and membership was opened to all interested individuals at the University of Idaho.

Club officers at the start of the school year were Kathryn Hunter, president; Mark Karl, vice-president; Bryan Fraser, secretary-treasurer; Carl Dirks, ranger; Bill Vaughn, reporter; John Johnson, professional chairman; Matt Fields, senior representative; Stephanie Martin, junior representative; Pat Murphy, sophomore representative; and Pat Baker, freshman representative. Faculty advisor was Jack King.

The two most important activities the club participated in were the College of Forestry, Wildlife and Range Sciences Barbecue and the Forestry Club's annual Cordwood Project. The FWR barbecue started the semester off early with an afternoon of good food and tough competition in woodsman's skills at the University of Idaho's arboretum. The Forestry Club was in charge of the woodsman's activities which included axe-throwing, cross-cut sawing and the caber toss. Bob Irwin and Matt Fields officiated as judges, recording the scores and deciding on the winners.

The Cordwood Project is a club fund-raising activity that enables members to cut and sell cords of firewood from the university forest. In addition to providing money for

future club activities, participants were exposed to various woodsman's tools and skills seldom encountered during classes. In order to beat the winter weather, the club began cutting with their chain and cross-cut saws soon after the barbecue. Kevin North, ex-forester camp truck driver, took up the wheel again to chauffer us around in the cattle truck. The project ended with a good profit for the club and a lot of fun for the participants.

With the change of semester and year to the spring of 1975, the Forestry Club underwent a change of its own. The club lost its faculty advisor, president, ranger, and junior class representative for the semester. The first meeting of the club during the spring semester included some officer elections and a vote on two new faculty advisors. The election resulted with Matt Fields as president; Don Gemmer as ranger; Jay Dorr as the senior class representative; Kevin North as the junior representative; and the new advisors were Leonard Johnson and Jim Fazio.

Some of the activities the Forestry Club will participate in during the spring semester of 1975 are: a weekend retreat at the cabin in the school forest, a trip to British Columbia during spring break for a logging team meet; the spring College of Forestry, Wildlife and Range Sciences Barbecue, and possibly an early start on the Cordwood Project. These activities plus plenty of smaller group activities and outings will help round out the 1974-75 school year and bring it to a close.

Society of Wood Science and Technology

The SWST chapter is comprised of students majoring in the fields of wood science-engineering and forest products and offers a wide spectrum of activities ranging from the educational to the recreational.

It has been the general program to have a guest speaker at our by-monthly meetings. The speaker may be a faculty member from another department on campus or a visitor from industry or another university. In the future, we hope to touch upon such subjects as the use of trus-joists in the erection of the stadium roof here at the university, some of the plans, problems and ideas on home building, as well as some interesting films. Suggestions are always welcome.

At least once a year we congregate at the home of Dr. and Mrs. John Howe for a beer party. The Howe's are great hosts and Doc still claims he doesn't know how our headlights got taped and all those tin cans ended up tied to our bumpers! Also, Bob Shoemaker is still wondering how he got home with his car and all **your** wheels.

These parties are an excellent chance to get to know fellow students, advisors and faculty members. Perhaps this and our close contact with alumni are what make us such a tight-knit organization.

The Wood Utilization Department is rapidly growing with a current total of 30 students including four graduate students. We are also fortunate enough to have two new faculty members, Leonard R. Johnson and John E. Houghton.

On behalf of the entire SWST chapter, I would like to take this opportunity to invite you to visit one of our meetings and talk with us on any one aspect or the entire option. After all, people and their ideas are the constituents which made our forestry college the fine institution it is today.

Wildlife Society

The Wildlife Society at the FWR college is especially oriented toward students majoring in wildlife or fisheries, but is open to students in all the natural resource fields. This year, our chapter has a membership of approximately 90.

The club schedules speakers from federal and state agencies to discuss various aspects of wildlife and fisheries management at monthly meetings which are well attended. Some of the topics covered this year included wolverine and leopard research, Idaho steelhead status, elk calf survival and bird trapping and banding in the Mideast for the Smithsonian Institution.

The meetings help familiarize members with current management techniques and problems, and also give members an opportunity to meet agency personnel — an important opportunity with regard to students' future employment.

In addition to the monthly meetings, graduate students in the college give by-weekly talks to members about their projects in an effort to acquaint undergraduates with graduate work.

Last April, the chapter sent four members to participate in the Wildlife Bowl during the annual Wildlife Society Conclave at Humboldt State University in Arcata, Cal., the heart of redwood country. Any FWR student that wanted to go was able to attend and many extras tagged along. Besides being able to see the ocean, the magnificent redwoods and the college, our team members and associates found time to go streaking and body surfing, and on the way back we entered Dr. Hornocker in an Easter Bunny coloring contest at Denny's Restaurant.

The Idaho State chapter of the Wildlife Society accepted an invitation to host the state's annual meeting this year. The topic covered was Endangered and Threatened Species of the Northwest. The symposium gave members an excellent opportunity to hear and meet personnel assigned the responsibility of managing wildlife for the public agencies. Students were also able to talk with individuals doing research at the universities in Idaho and Washington.

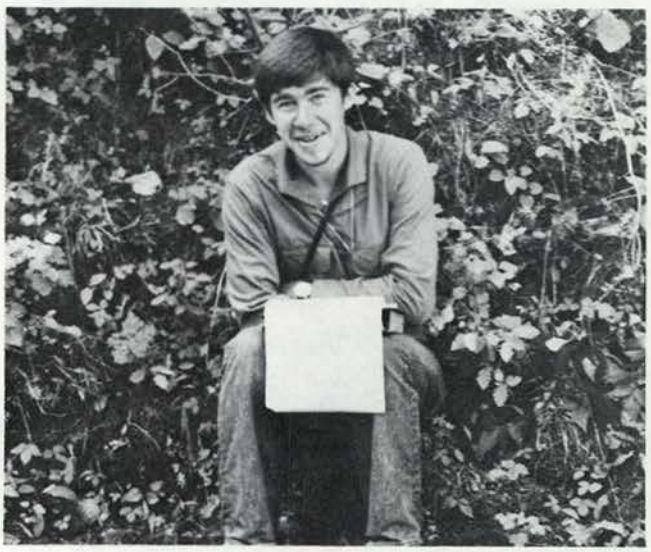
As in years past, members of the society were called upon by the Idaho Fish and Game Department to help with steelhead creel census work on the Clearwater River and to help at game check stations during the fall hunting season. Several members also helped the Forest Service plant browse on eroded areas to protect the stream habitat from deterioration.

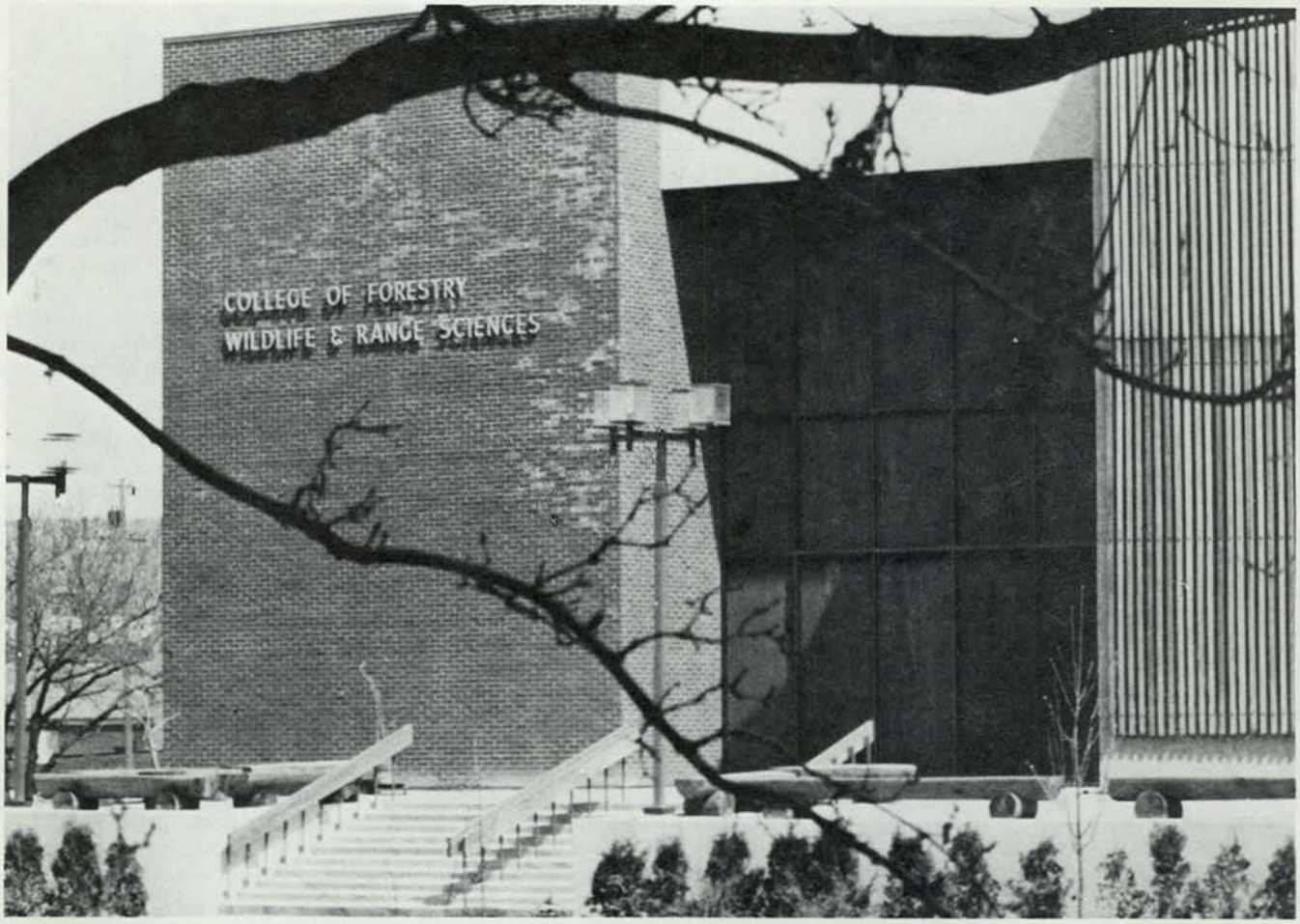
The members this year decided that instead of the traditional fall raffle as a money-making project, something new should be tried. The first project was a trip to the Kelly Creek Ranger Station to collect seed cones for the Forest Service. After cone picking, the evening was spent around the campfire talking and feasting on the wildlife manager's staple, beans and weiners, washed down with a tasty drink that originated from clear Rocky Mountain spring water. Sunday morning's chewy pancakes were made palatable by the addition of fresh elderberries gathered by several of the members.

A second fund-raising scheme was a turkey shoot. On the day of the event, however, Mother Nature reached into her bag of tricks and spilled out rain, which turned the Latah County silt into mud. The result was a small, unenthusiastic crowd and zero profit.

During spring semester, the chapter is planning a picnic with the Washington State University Wildlife Club. Besides being a lot of fun, this event will provide an opportunity for the members to exchange ideas, and hopefully build a closer relationship between the two clubs.

As you can see, the Wildlife Society is one of the most active and enjoyable clubs in the FWR college. Students are invited to participate in the organization's activities. It is to your educational and recreational benefit to do so.




COLLEGE OF FORESTRY
WILDLIFE & RANGE SCIENCES

Xi Sigma Pi

The Epsilon Chapter of the Forestry Honorary Society began at a fast pace last fall, at least relative to the many previous years inactivity. This year's officers were elected entirely from last spring's initiates and so were flung into a Society they knew little about. We took a vote and decided to reestablish an active chapter of the Society; since then, progress has steadily been made.

Toward the end of last semester, we had a fall initiation and banquet, a phenomenon that has not occurred for several years. After harrowing interviews of prospective initiates, arrangements were made for the initiation banquet by Jim Davis.

Twenty-six initiates were sworn in as members at the dinner and three more who could not attend the dinner were initiated later. Dr. Joe Ulliman presented a slide show at the dinner, introducing remote sensing as a young and expanding field and including a 3-D experience as a finale. The new initiates contributed many new ideas for future projects some of which will be realized this semester.

Activities this spring semester concerning initiation have begun quickly, due to a decision last semester to streamline student initiations by eliminating the interview. Also, faculty and professional staff are being considered for initiation now on an annual basis. A social get-together, arranged by Pat O'Rorke, is scheduled for both members and all prospective members, so that we can get to know possible initiates prior to their selection.

Xi Sigma Pi is branching out into media presentations for public relations in and outside of this college. Al Merkel is putting together a slide show of spring wildflowers of this area, to be shown to women's groups and schools in Moscow. The gears are grinding to have presentations ready for Forestry Week, with at least one presentation to represent each of the different options in the college.

Included in our plans for Forestry Week are speakers, movies and displays. Duane Hayman, Nancy Clifton, John Bremmer, Chad McGarth and Bill Vetter, to name a few, are working on these. Bill Oeklaus is in charge of contacting the possible initiates this spring; Hank Harrison is working out the details of the spring banquet and initiation.

This year's officers are Randy Adams, forester; Jim Borowitz, assistant forester; Vince Cargile, secretary-fiscal agent; Jay Dorr, ranger; Hank Harrison, Executive Council representative; and Dr. Charles Hatch, faculty advisor.

The Epsilon Chapter would like to extend a hearty thanks to those faculty and student members who supported and actively participated in our endeavors, especially Chuck Hatch.

Range Club

Range Club? Oh, that bunch of sheepherders! Well, not quite. Range Club was formed, or reformed I should say, last spring. In numbers, we are small but we have a high percent of the option at most of our meetings. Our president is a graduate student; our secretary is a junior. Freshmen and sophomores, where are you?

Something you probably didn't know: we don't have dues, not for Range Club. Of course, most of us are members of the Society for Range Management. That is where some of the fun comes in. Take, for example, the Idaho section meeting at Idaho Falls last November. Eight of us went down, met some interesting people, learned some things and formed a warm friendship with some of the local bars.

Our normal activity has been sponsoring speakers on issues of interest to our option and the rest of the college. Norma Dobler of the Idaho legislature, Dennis Froeming of the Soil Conservation Service, Vic Standa from the Forest Service and Dr. Daubenmire have been some of them, covering issues from land use planning to habitat types. We encourage everyone to come to our speaker meetings.

We plan to expand our activities this spring. For Forestry Week we hope to start a couple of new traditions. One is a plant identification contest between Range and Wildlife. Another is a sheep shearing contest. Whether or not we actually succeed with that will be seen.

Other plans include get-togethers with the WSU Range Club and Block-and-Bridle Club and Rodeo Club from Agricultural Sciences. Next year should see the continuation of the plant identification team to send to the National Society for Range Management meeting. Our team competed in Tuscon in 1974, and had a lot of fun doing it. This year we found Mexico City out of reach financially, sadly.

Watch for our announcements or just come up to the office and talk to someone about us. Range Club is growing but it needs help. Bring your ideas and enthusiasm. They are the keys to what Range Club does in the future.

NEW FACES

Dr. Ernest D. Ables fills two roles here in the college. First he is associate dean of academics and second he is a professor of wildlife management. He defines the former not as a job of keeping records, but of keeping the faculty and students interested in what they are doing. He constantly evaluates the quality of courses, and works on the college's overall curriculum by exchanging ideas with other institutions, and by coordinating existing programs within the college.

Dr. Ables also teaches courses in fish and wildlife populations, wildlife ecology and advanced population biology. He says he wants to keep up to date with what is happening in the wildlife field, and keep in touch with the students and the classroom situation.

Dr. Ables received a bachelor's degree in wildlife management from Oklahoma State University and then his master's and doctoral degrees in wildlife management and ecology from the University of Wisconsin. He was an associate professor in Texas A & M University's Department of Wildlife Science before coming to Idaho and has studied red fox in Wisconsin; turkeys, quail and deer in Texas; and impala gazelle and Thomson's gazelle in Africa.

One of the vital aspects of wildland recreation management is communicating with the public. The public is what recreation is all about, and an informed public will be able to use the land more wisely without destroying it, and get more out of the experience. Communicating with and informing the public is what **Dr. James R. Fazio** likes to do.

Dr. Fazio received his bachelor's degree in forestry from West Virginia University and his master's degree at Cornell University, where he researched a communications short course aimed at natural resource personnel. He recently completed his doctorate at Colorado State University, where he studied methods for modifying the behavior of wilderness recreationists in Rocky Mountain National Park.

Dr. Charles R. Hatch designs mathematical models to aid land managers in the selection of management alternatives. He is also the college statistician, helping researchers in the college with statistical problems and designs.

Dr. Hatch received his bachelor's degree in forestry from the University of Montana and his master's degree in forest management from Oregon State University. He received a doctoral degree in forest mensuration with a minor in statistics from the University of Minnesota.

Dr. Hatch teaches courses in models for resource decisions and advanced forest mensuration and is an advisor for both graduate and undergraduate students.

Remote sensing generally means the detection of objects at varying distances and is often associated with aerial photography, according to two experts in this field, **Robert C. Heller** and **Dr. Joseph J. Ulliman,** who were added to the college's staff this fall.

Heller received his bachelor's and master's degrees from Duke University. He worked as a pilot and research forester for eighteen years in the Forest Insect Laboratory at Beltsville, Md. and has put in more than 6,000 hours of flight time as a pilot. He says that he sees his present job as a research professor as an opportunity to teach what he has learned through his experiences. He is teaching a basic remote sensing course.

Dr. Ulliman received his master's and doctoral degrees from the University of Minnesota and his bachelor's degree from the University of Dayton at Dayton, Ohio. He studied applications of satellite imagery to land use mapping and classification in Minnesota. He later did extensive work in conventional aerial photography while teaching remote sensing courses at the University of Minnesota. Dr. Ulliman is an associate professor at the college and is now teaching a course in photo interpretation.

John E. Houghton has a very optimistic outlook on his job. He sees a good future and a good chance to do research here in the State of Idaho in his area of interest. His interest is the business-management-marketing-economics portion of forestry.

He obtained his bachelor's degree in forestry from Michigan State University and his master's degree in financial management from Western Michigan University. He is presently completing his doctoral degree in resource economics from Michigan State University.

Leonard R. Johnson is our new assistant professor of forest engineering. Presently he is teaching classes and doing research on logging costs and harvesting methods. He is trying to find out what kind of skidder would be most efficient with a feller buncher and a portable sawmill or whole tree chipper system.

Johnson received both his bachelor's and master's degrees from Montana State University, where he majored in industrial engineering.

Dr. John E. Mitchell is the new assistant professor of range resources. Dr. Mitchell received his bachelor's degree in range management from Washington State University. He obtained his master's degree from Utah State University in range ecology and his doctorate in systems ecology from Colorado State University.

Dr. Mitchell presently heads the college's mine spoils study, aimed at reclaiming land affected by mine wastes and smelter fumes in the Coeur d'Alene Mining District.

From Washington D.C., where he was Chief, Division of Recreation, for the U.S. Department of Interior's Bureau of Land Management, comes **Dr. Floyd L. Newby.**

Dr. Newby teaches and does research in wildland recreation. Dr. Newby feels that Idaho is ideal for this work because of the state's significant wilderness resources.

Dr. Newby received his bachelor's degree from Utah State University and his master's and doctoral degrees in forest recreation from the University of Michigan.

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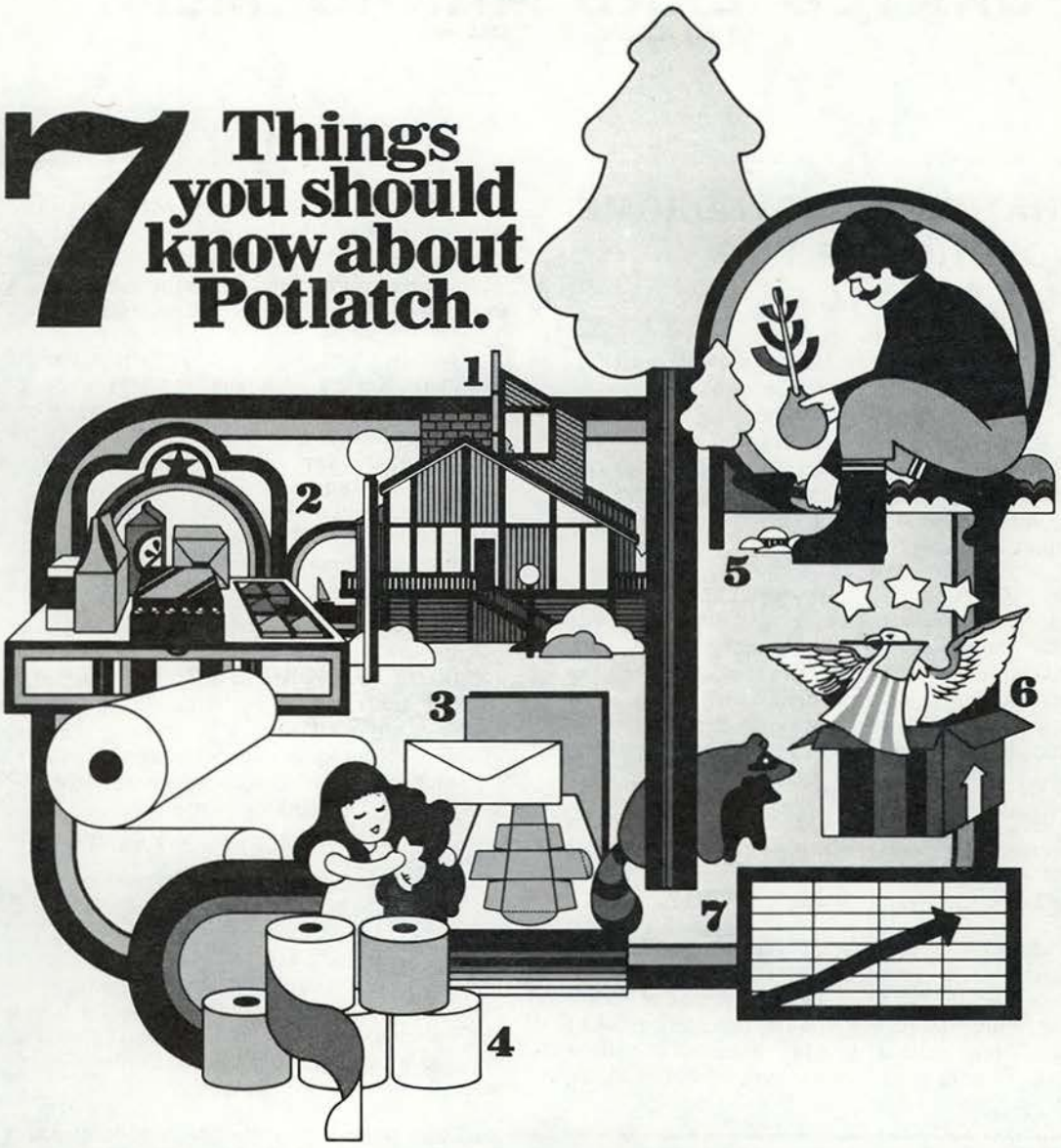
7 Things you should know about Potlatch.



1 We are a major source of wood products. We supply lumber for residential and commercial construction, remodeling and industrial uses. If all our 1973 wood production had been used for homebuilding, it could have provided housing for every family in a city the size of Tucson.

2 We're in the packaging business. Our 12 packaging plants manufacture folding cartons, liquid-tight containers, and corrugated displays and containers.

3 We make paper and paperboard. Our mills produce approximately 630,000 tons of paper, pulp and paperboard annually – nearly six pounds per capita for everyone in the U.S.A.

4 We're one of the nation's largest suppliers of private label household products. We've made major expenditures to improve our facial tissue, paper towels, bathroom tissue, and other paper products, making them competitive in quality with nationally-advertised brands.

5 We manage our forests for perpetual yield. Potlatch owns 1,300,000 acres of forest lands in Arkansas, Idaho and Minnesota. We employ the best forestry techniques to assure reforestation and keep our trees healthy.

6 We have a strong sense of social responsibility. We have made major capital expenditures for air and water pollution abatement facilities at our mills.

7 We are dedicated to achieving a growing profit and a reasonable rate of return. Our business philosophy states our belief in highly motivated, talented people and sound planning. In 1973, our emphasis on people and planning combined with generally favorable market conditions to bring Potlatch record sales and earnings.

Our company magazine outlines the scope of our activities in forest management and the production of wood products.

We invite you to write for a copy.

Potlatch People Mean Business.

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INTEGRATED LAND MANAGEMENT

ALTERNATIVE "C" SYNDROME- THE EVOLUTION OF THE FOREST SERVICE APPROACH

Donald M. Winslow

There is a widely held view that land use plans are predetermined in the Forest Service, and usually highly predictable in their outcome in the sense that choices are narrowed down by statutory or quasi-statutory authority.

The ambiguity of National Forest legislation suggests just how narrow these choices are. Congress, unfortunately, has not specifically established priorities among forest uses. Moreover, judicial interpretation of the various laws relating to Forest Service activities have not significantly aided in setting priorities. In the absence of any congressionally-established weights or judicial priorities, the Forest Service is left to establish its own land use priorities.

The diversity of the National Forest System and of its employees precludes a truly deterministic outcome to land use planning. The Chief's statement of objectives and policy guides for the Forest Service are broad and discretionary.

The two framework objectives which relate most directly to ground management are: promote and achieve a pattern of natural resource uses that will best meet the needs of people now and in the future, and protect and improve the quality of air, water, soil and natural beauty. These affirmations necessarily lead to more specific statements of policy at the regional level.

Don Winslow is multiple use staff officer and planning team leader for the Clearwater National Forest, Orofino, Idaho. He has served fifteen years in various capacities with the Forest Service and the Bureau of Land Management in Idaho, New Mexico, Arizona, and Washington D.C.

One might ask, "Do the regional objectives and policies establish forest use priorities?" Directly they do not, but there is a hint of land use objectives in Regional Direction Al-2: "Establish resource management and coordination within the framework of the ecological capabilities."

With this background — legislative, judicial, policy and objectives — the land use allocation picture becomes very clear. All we have to do is provide a technological basis for making decisions and we are home free — almost.

Inherent land characteristics can be mapped and land use constraints determined, narrowing down the range of choices for land use. This approach is described in Wertz, Arnold and Alvis' Land Systems Inventory. This is a land stratification system based upon the principle of recognizing the geomorphic nature of the earth's surface along with an understanding of the factors which determine behavior of ecosystems; materials, time, climate, vegetation, landform and animal life.

Unfortunately for advocates of technological determinism, the people of this country have not subscribed to "technocracy," or the doctrine of government in which all economic resources, and hence the entire social system, are to be controlled by scientists and engineers.

In describing the management environment in the Northern Region, Dils suggests that some Forest Service personnel believe that if all the environmental constraints were observed, these alone would determine an optimum management plan. Dils concludes that "this is not necessarily so and management cannot abdicate its function in favor of environmental determinism. The addition of constraints simply narrows the range of acceptable alternatives, but hard choices still have to be made among alternatives."

The notion that Forest Service land use plans can be selected purely by technical-scientific means should be dispelled once and for all. Freeman describes technologies as social because they are developed, employed, diffused, constrained and advanced by human beings acting in systems of social group affiliations. He suggests that individuals and groups systematically over-invest resources in those activities in which significant costs are "externalized"—i.e., borne by groups other than the investors.

INHERENT WEAKNESS

The inherent weakness in land use planning appears to be the inability to portray all the consequences of a course of action or a plan selection. In Northern Region Management Direction A2-2, "The unquantified environmental amenities and values of National Forests will be recognized and given consideration along with other resources." In order to meet the nation's need for timber, A6-1 directs that "Timber volumes produced from National Forests will be determined through multiple use planning."

These policies provide philosophic direction, but by no means attempt to resolve on-the-ground conflicts or establish priorities on a single acre of National Forest. Thus, the process of social and technological conflict in decision making continues.

How does the Forest Service establish weights or priorities for resources on specific tracts of land? The question is rhetorical because this entire paper is devoted to a discussion of the subject. In the Multiple Use-Sustained Yield Act, multiple use is defined, in part, as "making the most judicious use of the land for some or all of these (renewable surface) resources or related services over areas **large enough** to provide sufficient latitude for periodic adjustments in use to conform to changing needs and conditions; that **some land** will be used for less than all of the resources.....In the administration of the National Forest due consideration shall be given to the relative values of the various resources in **particular areas.**" (emphasis added).

The Multiple Use Act also says: "The establishment and maintenance of areas of wilderness is consistent with the purposes and provisions of this Act." The Act does not attempt to define the size of the areas on which multiple resources are to be managed; nor does it establish the number of wildernesses to be established and managed. Consequently, the Forest Service has had to develop a rationale for allocating resources.

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"...the name of the game — integrated resource management — the guiding principle of the 20th Century forester."

FORESTRY EDUCATION AND INTEGRATED RESOURCE MANAGEMENT

Ernest Ables

Ed. Note: for author information see New Faces section

"This plantation is seeded from improved genetic stock and we hope to produce a faster growing tree, yet one that yields high quality products."

"See that rather natural looking clearing? Well, it did have straight boundaries but we came back in and cut the margins to correspond with the natural contour of the land."

"This stand will be horse-logged to minimize disturbance. The stand is also an important elk calving ground."

"We had to be careful with this cut. Snow packs are heavy and the watershed received high recreational use."

"That stand of lodgepole pine is heavily parasitized with mistletoe; it will provide us with a large portion of the allowable cut."

"We have seeded by air and planted by hand, yet there is still no regeneration. Those southwest facing slopes are a problem."

The above comments are not figments of my imagination. They are paraphrased from actual conversations by foresters in northern Idaho and Montana, and were made during a field trip this past summer. Nor are they unusual in the least, just merely indicative of the normal considerations the modern forester must contend with in managing forest stands.

Just these few comments have identified genetics, esthetics, wildlife ecology, recreation, hydrology, tree diseases and microclimatology as necessary concerns of the forest manager. These are only a few of the numerous disciplines whose expertise must be brought to bear in making management decisions. No single one of these factors can be considered alone, each has to be balanced carefully with all of the others. And this is the name of the game—integrated resource management — the guiding principle of the 20th Century forester.

The implication is that a forester must be knowledgable in many fields of science, which might lead one to conclude that he or she will become "a Jack-of-all-trades, but master of none." This, of course, is not true. A forester must be a good silviculturist and at the same time a well-rounded general ecologist capable of recognizing the need for additional expertise to solve particular problems. He must know when to call in the experts, he must be able to communicate with them, he must analyze and interpret their data and recommendations, and finally he must integrate it all into his management plan.

There will be times when the experts are not available and he must carry out their functions himself. This is demanding a lot from a forestry graduate, but I believe the holder of a bachelor of science degree in forest resources from the University of Idaho can meet the challenge.

Educational needs of the modern integrated resource manager are provided by a number of factors—facilities of the educational institution, qualifications of the staff, the student body, and the instruction received. The College of Forestry, Wildlife and Range Sciences is housed in a new building equipped with modern laboratories and teaching facilities. Computer terminals are housed in the college and these are being expanded to enhance and make more efficient the teaching of large classes.

Within a few miles of campus are several units of the school forest, which allow on-the-site instruction. All forestry students spend one summer at the McCall field station, where they become familiar with forest communities and techniques for measuring them. This field session offers one of the better opportunities for gaining an appreciation of integrated resource management.

The administrative and physical structure of the college provides a unique opportunity for the forestry student to gain an appreciation for multi-disciplinary approaches to resource management. There are six program areas — forest resources, range resources, wildlife resources, fisheries resources, wood utilization and wildland recreation management — all housed under one roof.

Both staff and students interact regularly with their counterparts in all disciplines. Seminars in one discipline are attended by staff and students from another. Some seminars are deliberately combined to promote interactions and exchange of ideas. Guest speakers present programs that are attended by students from every program area in the college. The student body of the entire college engages in social functions as a unit. Thus the opportunity for professional and social interactions creates an excellent atmosphere for exchanges of ideas and philosophies; perhaps difficult to measure in concrete terms but nevertheless not to be discounted lightly.

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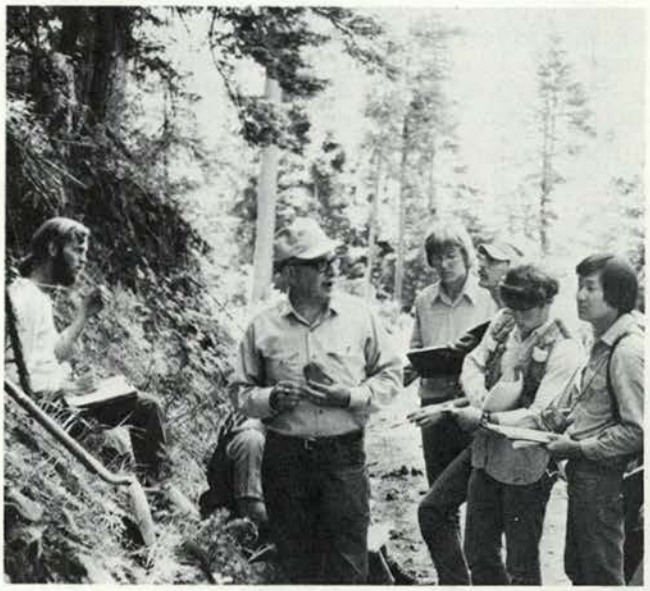


LANDS MANAGED OR MISMANAGED? A USER'S VIEW

Laird Noh

In recent years, public input has played an increasing role in integrated land management. While it is a useful tool for a variety of reasons, there may be a trend towards overemphasis, sometimes at the expense of sound, professional decison making.

Public input may have become somewhat of a "sacred cow" and hence, have escaped the spotlight of critical examination. It is in the spirit of objective and, hopefully, constructive criticism that these comments are offered.

Almost all professionals associated with land management decisions recognize that public input undisciplined by sound, experienced judgment can lead to bad decisions. In one sense, public input can be uninformed or misinformed, at least to the extent that the public is commenting on technical subjects or is far removed from the land or problem involved.

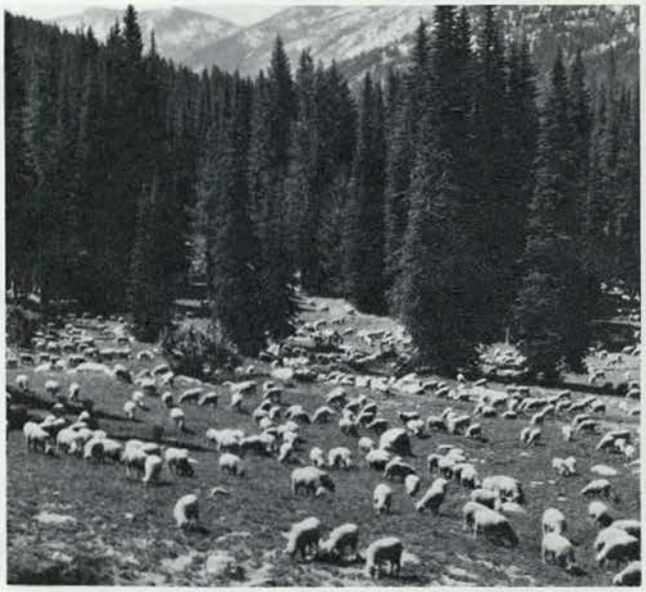
Often, counterbalanced against this type of public sentiment is the scientific or professional expert. Often one is thrust against the other, and the decisions of administrators or lawmakers must weigh both sides in arriving at the proper decision.

A sheep rancher from Kimberly, Idaho, Laird Noh has served for the past two years as chairman of the Predatory Animal Committee of the National Wool Growers Association, and president of the National Lamb Feeders Association. He received a B.S. degree in animal husbandry from the University of Idaho in 1960 and a master's degree in business administration from the University of Chicago in 1963.

An extreme example of what can happen when the voice of professionalism is not adequately heard or counterbalanced against public input is the so-called Wild Horse Act. I have yet to talk with one experienced range manager, wildlife biologist or public land administrator who felt the legislation was sound either before or after passage. Yet the bill sailed through Congress on a tide of school children's letters. In this extreme case, the voice of professionalism was not heard at all.

It would seem that as the decisions involving land management become more complex and as more variables must be weighed, there may be a need, especially in Congress, to strengthen the role of professional input as against raw public or political pressure. In the management of wildlife resources, the prudent course in the past has been to remove decision makers from direct political pressures as a means of insuring choices would be selected on the basis of best scientific judgment. Management decisions emanating from the Federal government should be placed in a similar position.

One of the inevitable plagues on the resource manager is that there is no convenient means of quantifying important variables such as "the value of hearing a coyote howl." This must be weighed against the measurable value of income lost to a local community when too many coyotes howl on a sheep range.



Too little attention has been devoted to developing methods of evaluating the worth of these intangible variables. Usually the estimates are based upon the volume of letters generated from controversial proposals. However, it is important to remember when making comparisons between the measurable and the immeasurable, that citizens vote every day in the market place.

People vote for beefsteak or they vote for movies. Those votes are important because in order to choose one commodity, another must be given up. There is a sacrifice involved, for incomes are limited.

Sometimes the choices posed to citizens in land management decisions do not involve sacrifice, and hence, become free to that consumer. It is easy to vote for a commodity if it is free. For example, the Eastern conservationist may be asked by his leader if he cares about preserving wild horses. Certainly he will vote yes by writing his Congressman. He incurs little cost beyond paper and ink.

It might be more pertinent for the Bureau of Land Management to establish checking stations around areas of known wild horse habitat and count the people who are willing to make the sacrifices necessary to attempt to see wild horses. Or, perhaps, random samples should be made of the general population to see how many individuals have cared enough to make the sacrifice to try to view wild horses.

At one point in history, a group of economists expended countless hours of effort attempting to build a theory of business economics based upon some factors of human motivation other than profit maximation. It all came to naught, and they were never able to predict the outcome of even the simplest economic event. Perhaps, all attempts to quantify social variables will also fail. But the field is open for some imaginative efforts to rationalize the comparison between conflicting values in land management decisions.

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"However, the increasing value of resources and the growing number of conflicting users obviates the need for increased management intensity."

LAND MANAGEMENT AND MAXIMUM INCOME-THE GOAL OF OUR STATE ENDOWED LANDS

Jack Gillette

Jack Gillete is the Assistant Director of the Idaho Department of Lands in charge of forestry and fire. Since earning a master of science degree in forestry from the University of Idaho in 1954 he has been employed by the State of Idaho with a brief break to work for the BLM.

Land management is directed by the goals of the landowner. The management of Idaho's endowment lands is based on the constitutional requirement of securing maximum income for the several endowments.

The State of Idaho was granted lands by Congress for the use and benefit of public schools and other institutions. Such grant lands are also referred to as endowment lands. To realize maximum income, integrated land management is obviously necessary.

Within the constraints of land capabilities and economic practicability, multiple disciplines are utilized to approach the goal of maximum income to the particular endowment. In actual practice, such management plans are complex and require considerable manpower, equipment, time and money.

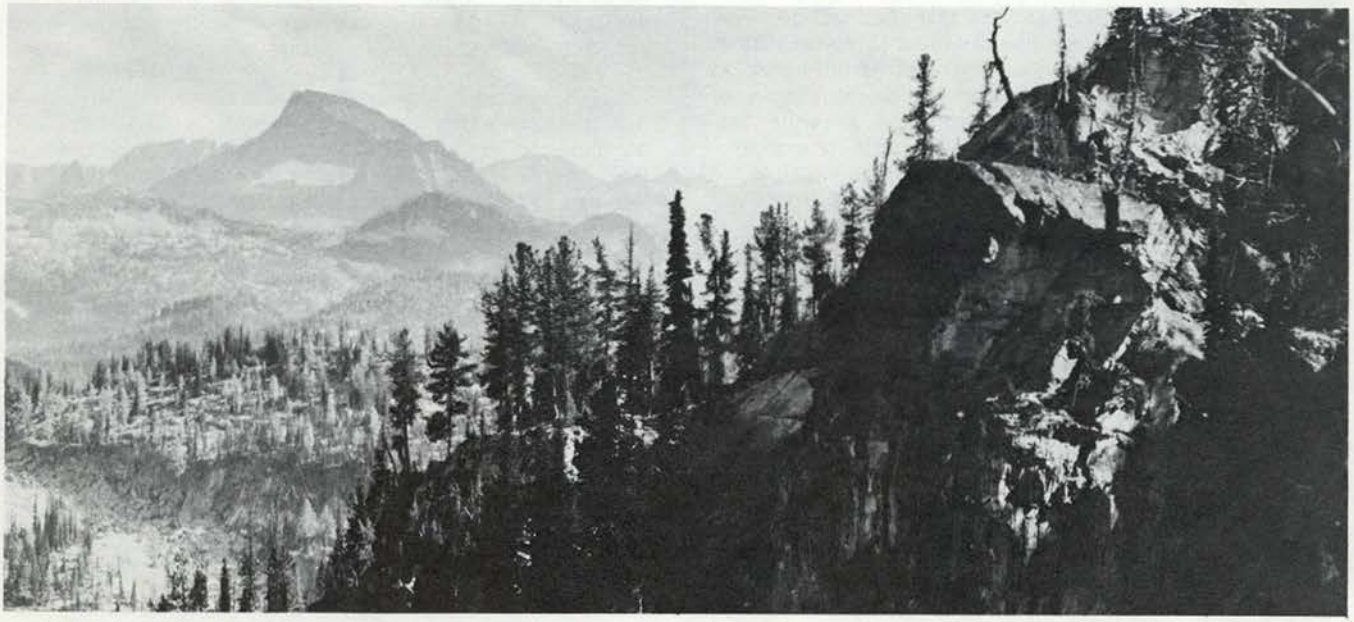
The managers at the field level can make broad estimates to develop comprehensive management plans and many times such plans prove to be reasonably close to the optimum obtainable at that time. However, the increasing value of resources and the growing number of conflicting users obviates the need for increased management intensity.

At the present time efforts are being made to more fully provide grazing and timber resources from the same management unit. Research indicates controlled grazing may benefit the establishment and early growth of seedlings. To carry through this project the planning must be specifically carried out at the ground level. I mention this rather simple example because particular knowledge is available, but success will depend on planning and, most importantly, on field application.

Improved utilization of forest products in harvest operations promises benefits for other disciplines. Reduced slash loads tend to lower disposal costs and fire protection costs as well as insect risks. Harvesting small-sized material moves much of our precommercial thinning to the commercial category. Low stumpage values of the smaller material has a high net value as thinning costs are eliminated and the residual stands' future value increases. Perhaps the greatest benefit is utilization of material that would, under present standards, never make it to the mill.

The time is fast approaching when wildland managers will correlate management plans with planning and zoning regulations of political entities. Objectives of individual landowners, including government agencies, may need modification to meet overall local and regional needs. Wildland managers should take an active role in local and regional planning as their expertise will tend to balance the total planning effort.

Comprehensive planning for endowment lands must be intensified in view of the factors outlined. Expertise in numerous disciplines needs to be acquired, such as in soils, hydrology and engineering. Additional personnel in forest and range management are needed. Greater consideration must be addressed to resource capabilities, future needs and methods of informing the public and governmental bodies concerning resource management. Economic alternatives should include the cost of maintaining the present status as well as the cost of taking no action.



"At any level of planning, the problem of identifying resources and structuring their relationships becomes very complex. The second step, visualizing and planning for the impact of land use decisions, is difficult even when the problem is structured but is impossible when it isn't."

MODELS-AN ABSTRACTION OF REALITY

Leonard R. Johnson and Charles R. Hatch

Ed. Note: for author information see New Faces section.

Land use planning, although the subject of much controversy, has found increasing popularity and use at all levels of government.

One goal of land use planning is to make the most effective use of existing resources. A prerequisite to designing ways of effectively using resources is the identification of those resources that are available to planners and the relationship of one resource to another.

At any level of planning, the problem of identifying resources and structuring their relationships becomes very complex. The second step, visualizing and planning for the impact of land use decisions, is difficult even when the problem is structured but is impossible when it isn't.

Problem structure and decision-making assistance represent two important advantages of model development and use. Although there are limitations and disadvantages in carrying a modeling effort too far, some of the principles of model development can certainly be applied to land use planning.

The first step in modeling, as in planning, must be the identification of the problem area. This is followed closely by step two: establishment of quantifiable goals.

For the land use planning process, this implies identifying the decision makers in the process and what their objectives are in the planning effort. Establishment of objectives specifies the direction of the modeling and planning effort.

Once the problem area has been identified and goals established, the study team can identify those resources that lie within the problem area and can be used or influenced in working toward the system objectives. Identification of resources and potential uses for the resources gives the decision maker a breakdown of the alternatives that are available. When the alternatives are tied to the wants and needs of the people in the problem area, the decision makers have the basic data needed to make a decision.

However, the problem still lacks a structure capable of showing the impact of a decision on all resources. Without this structure and the knowledge of how resources are related to each other, a decision made to change one resource to achieve a desired objective could unknowingly cause an adverse effect on several other resources. The structure we are talking about and the potential decision making assistance take the form of conceptual and mathematical models.

A model, either conceptual or mathematical, is simply an abstraction of reality. The degree of abstraction can be highly variable.

For example, a map or photograph can be viewed as a conceptual model which represents a minimum amount of abstraction. A flow diagram or network (background figure) is yet another example of a conceptual model, but one representing a greater degree of abstraction. The flow diagram begins to define the detailed structure of the system as well as the interrelationships between components of the system.

This conceptual model can then be transformed into a set of mathematical relationships. Mathematical formulation is another model of the same system and represents a further degree of abstraction.

Frequently, conceptual models are of a descriptive nature. Their purpose is solely to give insight into the nature of the system. Their value for the most part lies in their construction. And their development requires that the resource planners totally understand the system and its interrelationships and that they evaluate its structure from several perspectives.

Mathematical models, developed from conceptual frameworks, are commonly of a predictive nature and are frequently more difficult for non-modelers to understand. However, since mathematics is a more international language, meanings tend to be less subject to a variety of interpretations. The strength of mathematical models lies in the fact that they can be used to predict the ramifications of a management action. Frequently these predictions represent an extrapolation of the conditions from which the conceptual model was built.

Together, the conceptual formulation of the modeling process in conjunction with a mathematical development of those relationships provide land use planners with a highly structured definition of the system. This abstraction of the real system provides an opportunity to explore a variety of land use alternatives.

Conceptualization of land use planning might result in the model depicted in the background figure.

At some point, whether by input of development money or by legislation, a land use change takes place. Land is converted from one use to another. As a result, the intensity of use will change and both the development and the users will have environmental, economic and social impact.

The impacts of use and construction affect user satisfaction with the activity they engaged in and with the area. Impacts of use and development will influence future legislation and controls directly through the decision maker's view of the situation and indirectly through user pressures. Changes in regulation and control will influence future developments and land use changes.

The general model shown in the background figure seems rather simple. However, when details of the individual land uses, impacts, controls and their many interactions are added, model complexity increases enormously and the simple conceptual flow chart is transformed into a maze of lines and boxes. The complexity posed by this conceptual framework can be handled only through a simulation model.

Simulation models call first for a mathematical expression of the relationships conceptualized in the flow chart and then for continuous processing of these relationships as they change

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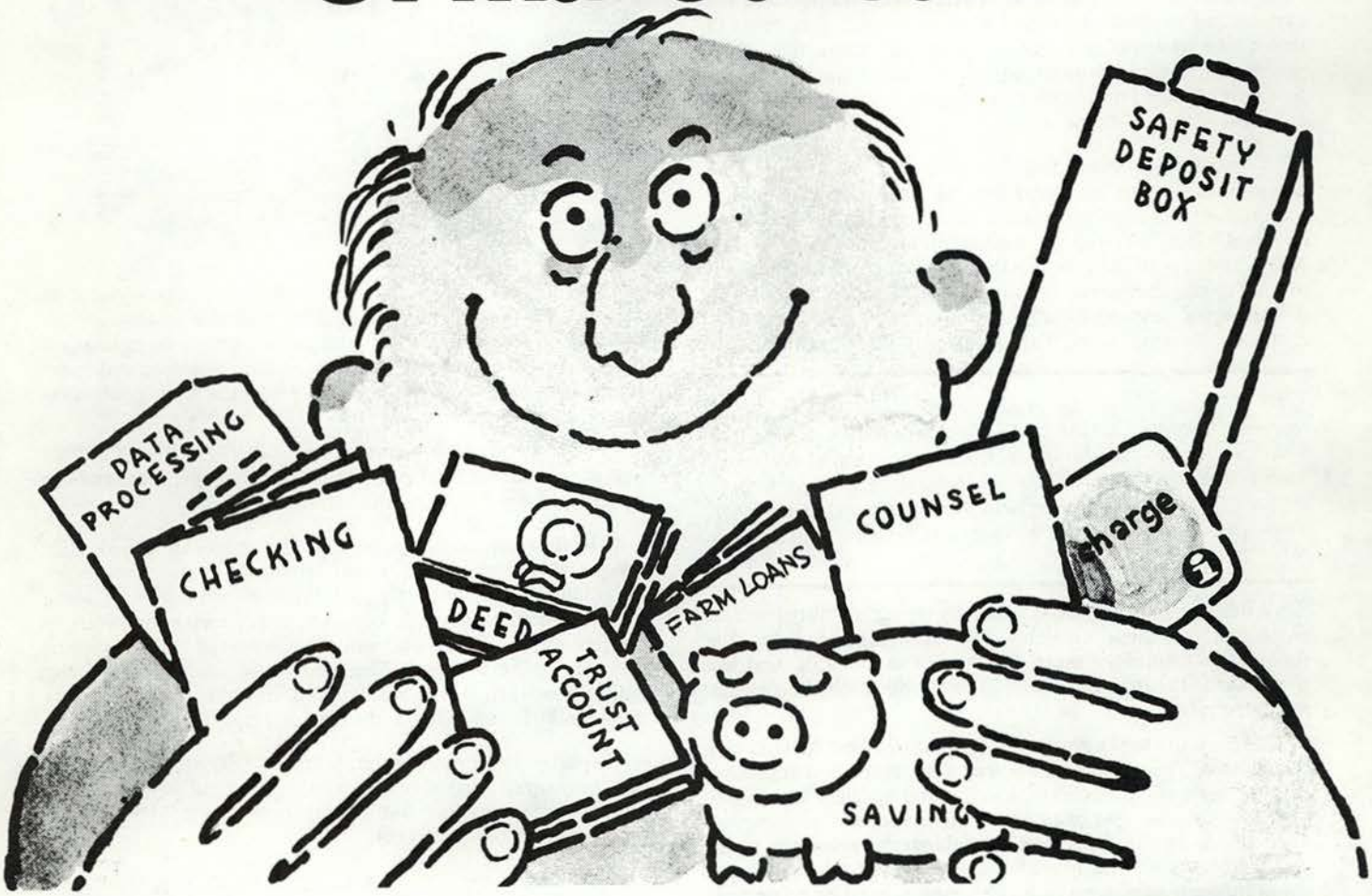
We think a bank should be more than a place to keep money.

Or make a loan.



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More than checking.
Like trust and estate services.
And escrows.
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And equipment leasing.

Travelers checks, bank drafts and money orders. Auto, remodel and new home financing. A number of financial programs for the farm. Data processing services for business and professional people.

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EQUAL TIME FOR NON-GAME SPECIES

VARIETY IS THE SPICE OF LIFE

Jack Ward Thomas

Wildlife biologists are frequently requested to make contributions to comprehensive land use plans that require consideration of the welfare of wildlife in general. These increasing demands have revealed a flaw in the training and experience of most of those professionals.

Wildlife biologists have, in general, been trained and are experienced in the management of game animals (i.e., those of interest to hunters) and pest animals (i.e., those that cause problems for man). Most animals fit neither of these categories and have received only minor management consideration and even less research attention.

A two-fold problem faces us now that interest in these species is coming to the fore. First, information on the habitat requirements and life histories of many species is nonexistent or insufficient for making management recommendations. And coupled with this, there is the equally perplexing problem of how to simultaneously consider in one plan the needs, even if known, of perhaps hundreds of species of birds, animals, reptiles and amphibians. The complexity boggles the mind.

Dr. Thomas is currently project leader and principal wildlife research biologist at the U.S. Forest Service's Range and Wildlife Habitat Laboratory in LaGrande, Oregon. He is the author of some 90 publications on deer, exotic wildlife, wildlife diseases, wild turkeys, songbirds, habitat management, environmental forestry, hunter attitudes and behavior, and land use planning.

Wildlife professionals are belatedly trying to "hurry up and catch up" to these demands for knowledge; but for the foreseeable future, we must operate in the arena of land use planning with the data base and application knowledge available now.

I believe the best approach is a mixture of the specific and the general. This means that where there is specific desire for enhancement or protection of individual species, we should plan for that end. For example, if the protection or enhancement of the habitat of a rare or endangered species is to be considered, its habitat must be identified and taken into account in the planning process. The habitat must be protected, or the species will be lost or diminished within the area in question.

On the other hand, there are the hundreds of species for which there are no specific management objectives. However, there is usually one accepted goal—that as few species as possible or none be extirpated from the area concerned.

This goal may best be accomplished by moving from detailed information for guidance to an accepted ecological principle. Ecological diversity tends to insure stability of the system. Intentional maximization or retention of diversity can be a key to allow the protection, or even creation, of the habitats of those many native species about which we know little.

Photo by R. Drewien

The use of the diversity principle for this purpose might be called a "fail-safe" approach. The rationale is that in the absence of no knowledge of wildlife occurrence or habitat requirements, the best bet to insure minimum losses and maximum gains in numbers of species present is to provide maximum diversity in habitats.

This may be accomplished by considering existing habitats and manipulating land use, use patterns, crops, management systems, reserves, parks, and so on.

The first step under such a planning approach is to identify unique or rare plant and animal communities and, if possible, to anticipate the protection of these communities in some manner. Such areas are a key component under the diversity concept proposed here and must be considered from the first if they are to be retained. Their rarity or uniqueness usually emphasizes their vulnerability; and in some cases, there is precious little room for maneuver or error.

Riparian habitats are often found in this category, making up a very small portion of the planning area but adding a component to species and habitat diversity far in excess of its percentage of the land area.

The second step is to evaluate the habitats or general communities within the planning unit. Once these communities are identified and evaluated, each land use decision or habitat alternation should be thought of in terms of the effects on diversity.

This diversity approach must consider spatial requirements. This means simply that the habitats be in reasonable proximity and juxtaposition so that the effectiveness of the milieu is obtained. To illustrate, if the planning unit was essentially divided between forests, grasslands, suburbs and lakes, the diversity effect would be least if there were one entity of each, but would increase rapidly as the components were divided and mixed, plus edge habitat would increase enormously.

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"It would be superfluous to reiterate the arguments for or against predator control, but too often people who enter into such debates fail to recognize two basic facts relative to predators."

MANAGEMENT OR CONTROL? A NEW LOOK AT PREDATORS

Lanny O. Wilson

The purpose of this article is to point out that predator management must be an integral part of any land use plan. Management as defined in Webster's dictionary is "the act, art, or manner of managing, handling, controlling, or directing." In terms of predatory management, predator control, no control and considerations for rare wildlife species such as endangered and threatened wildlife are the basic components of the program.

The subject of predator control is an extremely emotional one. It would be superfluous to reiterate the arguments for or against predator control, but too often people who enter into such debates fail to recognize two basic facts relative to predators:

1. Predators evolved with specific physiological and behavior adaptations to kill other animals (prey species).

2. Many people working in the biological or ecological fields today have little knowledge that in given situations predators can have significant impacts on other animal populations.

Most professionals working in the biological or related fields received their educations and did research during the era of maximum predator control. The U.S. Fish and Wildlife Service is the primary agency responsible for predator control. The Act of March 2, 1931, Chapter 370, U.S.C. 426, established the section of Animal Damage Control in this agency. It was sometime after 1931 that funds and personnel were appropriated to undertake the program.

Lanny O. Wilson received his bachelor of science degree from the University of Wyoming and his master of science degree from Utah State University in wildlife management. He was the first BLM district wildlife biologist in the Salt Lake City, Utah and Burley, Idaho offices and worked in New Mexico as the BLM state office staff biologist. Currently he is the Idaho BLM state office wildlife biologist.

Betweeen 1935 and 1968 the predator control campaign was at its highest level. It was also during this period that predator control, particularly for coyotes, was directed towards total population control. During this period, most research found that predation was not a significant factor relative to the productivity of some wildlife or livestock populations. It must be recognized that much of this research was conducted during the era of maximum predator control and the same studies conducted today could result in different conclusions.

During the late 1960's, philosophies toward predator control began to change. The section of Animal Damage Control changed their program from one of "population predator control" to one of "problem area predator control."

In 1972 Presidential Executive Order 11643 restricted the use of toxicants on Federal lands as a predator control management method. This change was brought about primarily because of the change in public attitudes towards predator control. Therefore, we have traversed from an era of maximum predator control to one of problem orientated predator control with an overall reduction in predator control efforts.

Ramifications of this change are evident today. A 1974 study of the Steens Mountain deer population in Oregon revealed high reproduction of 132 to 134 fawns per 100 does. From 1968 to 1971, fawn mortality averaged 71 percent but increased to 88 percent from 1971 to 1974. Predation, principally by coyotes, was found to be the most significant cause of fawn mortality (Lightfoot, 1974).

Currently the predator management control methods which can be used on Federal lands and by professional district field assistants of the U.S. Fish and Wildlife Service are traps, calling with predator calls, shooting from the ground and shooting from fixed-wing aircraft and helicoperts. M-44's, "coyote getters," are being used on a limited research basis by authorized personnel and poisons can only be used under extreme emergency conditions when approved by the Secretary of Interior.

Maurice Hornocker

The factors that must be considered in land use planning in relation to predator control are when, where and by what methods.

For example, during the fall, early winter and sometimes in the spring, hunters and hunting dogs can be encountered in a variety of wildlife habitats. Areas of good gamebird populations should be identified, as the majority of gamebird hunters can be expected in those areas. Many states have hunting seasons for bear, cougar, raccoon and other wildlife species where hounds can be used. These areas should also be identified.

Any predator control methods designed to capture or kill coyotes in any area where hunting dogs are used can be ex-

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WOMEN IN LAND MANAGEMENT?

I USED TO BE A SECRETARY-NOW I WANT A CAREER

Kate Sullivan

One of the newest innovations in the modern concept of forest, wildlife and range sciences is the integration of women into this traditionally male-dominated field. The process is a slow one within the agencies and businesses of professional foresters, but at the College of Forestry, Wildlife and Range Sciences at the University of Idaho the task seems to be well on the way towards achieving elimination of outdated and misconcepted viewpoints towards female involvement in the field.

Enrollment of women in the college has substantially increased within recent years, even though the female enrollment is still only about nine percent of the total of the college. Of 604 undergraduates in the College of Forestry, Wildlife and Range Sciences, 57 are women. Of the 57, 40 are freshpeople and sophomores with only 17 juniors and seniors. There are five women in graduate studies.

Twenty-eight women have declared wildlife or fisheries as their discipline while 19 are in forest resource management. Range has only three, wood utilization claims two, while wildland recreation has seven.

Kate Sullivan is a senior in forest resource management science option in the College of Forestry here at the University of Idaho. Prior to coming to the college in 1974, she worked in the Northeast as a logger and in the management and production of forest Christmas products.

The experiences of many women at the college indicate that while they have met with skepticism and even covert discrimination among public agencies such as the U.S. Forest Service, the record of the college is one of refreshing enthusiasm and positive encouragement.

There is indeed more female involvement than ever in the natural resource management fields, but numbers and percentages are still startling low. Apparently there is still some sort of stigma attached to a forestry profession among American women. The women currently involved in forestry must not only fight the image of the traditional forester to be accepted in the field but must also dodge the image that is attached to women who barge into male occupations.

The attitudes, viewpoints and aims of the women in the college vary as much as the stew in the melting pot of America, yet many view the women involved in forestry as just a little different. "People think that since you're a woman in a man's field your ideas must be firmer. That's not always the case, but at least it doesn't seem quite so forbidding as it did ten years ago." (Nancy Clifton, senior)

Not all of the women within the college follow a strong career goal or drive to succeed in overcoming the odds against them in a forestry or range oriented profession. As in most departments in any university or college, a few are there for lack of a better idea.

This trend is especially evident among the freshpeople and sophomores who only rarely even enter the forestry building. Some of the women are aiming for a generalized education in a natural resource field while others are motivated towards pursuing a particular interest into either graduate level education or a career in professional employment.

Several women when asked to comment on what brought them into the forestry college responded with philosophies such as, "I wanted to work outdoors," and "I don't know why." One woman stated she came to college "just to come, and I figured a man-oriented field would be an interesting time — if I was to go I might as well do it differently." These points of view, however, are well within the minority.

Most women within the college have a much more concrete direction, although their goals may or may not have clear definitions. A generalized natural resource background in obtaining a B.S. is considered by many, both male and female, a valid alternative to a highly technical orientation in forestry or a too limiting framework within the biological sciences. An education in the forest, wildlife or range sciences will bring a broad knowledge of the environment as well as the educational tools needed to actively participate in a natural resource field at the decision-making level.

For many in the college this is enough. "I don't like social sciences or humanities. I understand the natural sciences. I don't want to be a wildlife manager, I just like the basic education." (Judy Spence, junior)

This type of fundamentalist approach to their education occurs amongst the men at the college too. "Striking a balance with nature — I want to communicate that to other people. I'm doing that now but I want to broaden my base. It's a romantic image maybe, but I really like it." (Mike Sullivan, senior)

Other men have equally philosophic motivations for becoming involved in the work they do now. "Since I was a little kid I'd hunt with my dad. I can't think of a better way to build up a relationship between parents and children, male and

FOR SURE

female. I have a lot of ideas that I don't think agencies have tried yet. The only way I could see to make changes was to get in there." (Justin Naderman, senior)

Perhaps the extreme in thought that gets one into forestry is the search for an education in the "woods." This is better envisioned if one regards it as an education in the environment and maybe even how to survive in it. Although a somewhat antiquated perception, a forestry education seems by the very nature of its ingredients a means to this end. Whether satisfaction of this type of goal is realized at the college is difficult to assess.

"What got a city-person like me into a field like this? I always wanted to be a hermit. With my stifled concept of what a hermit must be in my East Coast picture of a wilderness jungle I related an education in forestry as necessary to my survival as a hermit. It was wrong." (Arlene Blade, junior)

A philosophical or generalized approach to forestry by students at the college does not seem to imply a lack of interest or direction but rather a different perception of what a college education adds to a person's resume.

Although the traditional role for women has been to forfeit notions of a career and ambitions toward achievement, this pattern is changing as can be seen in the college. Women graduate students are increasing in number and many of the undergraduate students look forward to advanced degrees or employment in their field.

"I see my degree here as a means to an end—a good job in forestry. Eventually I'd like to get into wilderness study or something to do with bamboo logging." (Kathryn Hunter, senior)

"I used to be a secretary. Now I want a career. I want to work in something for the rest of my life doing something important." (Judy Spence, junior)

"Discrimination really baffles me. How can men expect that even though I've gone through four years of college and a Master's, I still won't be able to handle responsibility. I'm a very ambitious person. I intend to go back and get my PhD. I intend to do research no matter how much I have to do to accomplish it." (Peg Harris, research associate, soil microbiology)

Regardless of the motivations of women pursuing a forestry, fisheries, wildlife or range management education all must cope with the traditional attitudes that have marked women as outsiders in these fields. Women must often be super-achievers in what is viewed as a superman's field.

The old image of a forester was something akin to a robust lumberjack or forest ranger who lived their lives in constant danger in the great wilderness areas of America, but in terms of management did little more than supervise the cutting of timber and sharpen their axes. This image has excluded women to the point that now acceptance into the modernized profession is difficult.

While male (or for that matter female) foresters today may or may not fit the hearty physical image of a woodsman, the entire thrust of their professional abilities is toward sound land management policies and they are armed with the education to achieve them. A professional forester today is as likely to spend as much time in an office developing plans as in the field carrying them out. Yet many women from the college who have worked with the Forest Service, for instance, have met with skepticism that they can handle responsibility, antagonism from co-workers and opposition from male employees' wives. Perhaps this is a taste of what women can expect when they leave the nest of the college.

The U.S. Forest Service plan of complete equalization of male and female workers in summer-type employment has not worked as well as expected. Males working on National Forest crews complain that they've seen discrimination in pay without equalization of work loads. "Women aren't working out as well as hoped because many aren't doing the field work. It looks good on paper." (Rick Wilfert, senior)

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WOOD-USE IT WISELY

THE COMING AGE OF WOOD

George G. Marra

Wood, as a material produced by the biological processes of nature, has always been assumed to be beyond the control of man in regard to its properties. This assumption is no longer valid and must be challenged vigorously in order for wood to take its rightful place in the family of man-made materials such as steel, brick and plastics.

The key word in the transfiguration of wood to a new exalted position in our technological age is **synthesis.** The early beginnings of synthesis applied to engineering properties of wood occurred with laminated lumber, although the major gain in basic engineering properties has only recently been made possible through the advent of non-destructive testing. Plywood, also as an early example of a synthesized wood material, provided man not only with the first wood material in large panel form, but also with a degree of equalization of properties in the two panel directions.

The greatest gain in synthesis capability occurred with the invention and use of a number of small wood elements such as fibers, particles, strands, flakes and wafers. These basic wood elements, each with its own distinctive geometry, together with controllable processing variables, such as size of element, type and amount of adhesive, moisture content, pressure, pressure sequence, mix of elements and layered construction, provide a virtually unlimited field for the exercise of the principle of synthesis.

Dr. George G. Marra is presently Assistant Dean and Assistant Director of the Engineering Research Division of the College of Engineering at Washington State University. Prior to assuming this post in January of 1973, he was head of the Wood Technology section in the Research Division for 22 years. The Research Division consists of 18 research sections, each related to some aspect of industry or commerce important to the region and to the nation.

With the advent of orientation of elongated wood elements down to the smallest possible size, a whole new array of synthesized wood materials with unique properties is possible. This will be the ultimate in wood materials engineering, with some properties surpassing the best that nature provides in raw timber.

The fact that this goal can be achieved with wood otherwise unsuitable for the more conventional lumber and plywood materials, adds greatly to the technical triumph. The net effect will be a greatly increased supply of wood materials for the world's growing population.

An appreciation of the synthesis capability of wood comes at a most opportune time in the history of mankind. Widespread realization of the runaway depletion rates of certain key resources is focusing greater attention on wood as the multi-purpose material available in perpetuity in many parts of the world. Along with renewability as a sustaining virtue, nature's manufacturing plant — the forest — utilizes free solar energy exclusively and is an asset to the environment.

In summary, the practice of synthesis in wood materials accomplishes three important benefits for any society striving to maintain a high-technology standard of living beyond the year 2000:

1. It provides a greatly increased product output from the limited annual harvest of the forest resource.

2. It provides wood materials with improved properties for an expanded range of uses.

3. It provides a safe alternative to rapid depletion of metallic and polymeric (petrochemical) resources for fabrication and construction purposes.

The foregoing has tremendous implications for the professional wood scientist and technologist. It will also greatly influence his education and the scope of his research.

First of all, it is obvious that in addition to a knowledge of wood, i.e., solid wood as produced by nature, people in this professional discipline will have to understand the mechanisms by which individual wood elements interact to confer properties to the larger body. These wood elements vary not only in species, but also in size, geometry and surface quality.

The contribution of each element ultimately depends upon its orientation and upon the quality of bonding between itself and adjacent elements. Since bonding is a molecular phenomenon involving dissimilar materials, this area of knowledge can accommodate a wide range of fundamental scientific research. At the moment, the state of knowledge on this subject is near zero.

A second consideration is the manipulation of variables in the manufacturing process which in large measure control the properties of the resulting material. The selection of a bonding system is one of the most critical decisions, affecting both properties and economics. The amount of resin, its distribution and its rate of cure are all controllable variables with pronounced influence on final material properties.

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DEAD AND CULL TIMBER-RESOURCE OR WASTE?

Robert W. Nix and Frank J. Favor

The upswing in the pulp and paper industry during the past year has focused much attention on sources and potential sources for wood fiber.

One large source of wood fiber is cull and dead timber located 40 miles or more from chip plants or rail sidings, which, for the most, has historically been left in the woods. The cost of removing this material was prohibitive.

Silviculturally, the removal of this material is desirable to the forester to reduce fire hazards, clear ground for reproduction, and reduce breeding places for harmful insects. The attainment of these goals has been made possible by economic changes that have been a boon to cleaning up forests in this area.

A condition contributing to increasing shipments of inland pulp logs and chips to the West Coast this year was the decrease in Canadian pulp and chip exports. Large U.S. pulp mills found themselves without logs for their chippers and short on reserve chip supplies.

Mr. Nix, a 1971 graduate of the University of Idaho forestry college has worked primarily in wood processing facilities as a quality control and sawmill supervisor. His current responsibilities are with product-mix alternatives and mill processing efficiency at four Northwest Diamond International Corporation plants.

Mr. Favor is a 1951 graduate of the University of Idaho forestry college. He is currently responsible for logging operations and forest management policy on more than 162,000 acres of Northwest timberlands for Diamond International Corp.

In the Inland Northwest, an estimated 30 to 40 MMBF of dead pulp material was removed from the forest this year concurrent with regular logging operations and in separate "sanitizing" operations. Inland pulp mills were bidding for this material also, since supplies of chips from lumber residues had been reduced by lumber mill closures.

Finding an alternative to pulp to offset long freight hauls, Diamond International has been utilizing dead Idaho white pine to 8-inch top diameters in a localized lumber salvage operation at Fernwood, Idaho, to silviculturally improve their own lands.

Diamond sells cull cedar to cedar products producers. Other dead and cull timber, predominantly white fir, hemlock and Idaho white pine, is being utilized to 10-inch top diameters at our Albeni Falls, Idaho, whole-log chip plant. Utilization down to 4-inch top diameters was attempted, but logging and production costs were nearly doubled.

High logging and production costs at fixed facilities for small diameter material are a case-in-point for chipping precommercial and small diameter dead and cull material in the woods. There is potential for increased wood fiber recovery per acre utilizing this concept. Several woods chippers are currently operating in the Inland Northwest at semi-permanent locations.

Chipping in the woods could pay all or part of the costs for precommercial thinning. Foresters could manage more intensely if their precommercial operations would pay for themselves.

Technology and economics have made it possible for the forester to think in terms of total wood fiber management. It appears that this trend will continue.

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MAN AND WILDERNESS

USE IT WITH LOVE AND RESPECT

Floyd L. Newby

Ed. Note: for author information see New Faces section.

Let me introduce you to a different world— a new experience — a renewed appreciation for the components of our environmental heritage. As you imagine yourself standing on the crest of a remote and lofty mountain peak with the wind blowing in your face, the vastness of untrammeled forests, valleys and streams at your feet and extending to the horizon, what are your thoughts?

"I have conquered; I have pitted myself against this hostile environment and won. I feel small, insignificant and puny compared to that which lays before me. I am free and yet I am bound by my inability to understand and to sense all that is being offered my entire being."

If you have experienced any or all of these feelings, or others which are similar, you have had an experience falling somewhere in the subjective spectrum of "wilderness."

As you descend from your lofty view, changes occur in the proximate environment. You pass through differing life zones, each with unique characteristics, until finally you arrive at a sea, not of water but of heat with its waves of shimmering light whipped by breath-taking winds straight from the mouth of an inferno.

What have been your inward feelings during this transition? Have you changed from the role of conquerer to that of a transfigured tourist full of awe, wonder and a strong sense of uncertainty or insecurity? You are again having a "wilderness experience."

On your transitional journey, the components of the different environmental types have covered the entire spectrum from the macro to the micro—the massive mountains with elk, goat, deer and cougar roaming over them, to the blowing sand and plated mud of the desert graben with its infinite variety of minute flora and fauna soley adaptive to such harsh environmental conditions.

Invariably in this transitory journey you have encountered evidences of man, some intrusive, some perplexing and some intriguing in perceptual imagery. These evidences ranged from pre-historic man to modern technologically dependent man.

In most, if not all these instances, there was opportunity to learn, speculate, and relate to specific elements of our environmental and cultural heritage—the opportunity to begin fitting the parts of an evolutionary puzzle together into an understandable whole which places man not as the center but only as an integral part—the part which either helps bind or disconnect the component parts.

It is this integrated holistic relationship of man and the biosphere in which he dwells that challenges the resource manager to make provisions in his management goals to accommodate management of the wilderness resource, wildland recreation resources, and the role man assumes in pursuit of a "wilderness experience."

Aldo Leopold spoke of the resource management imperative in his **Sand Country Almanac** when he said, "When we see land as a community to which we belong, we may begin to use it with love and respect. There is no other way for land to survive the impact of mechanized man. . ."

Although Leopold saw land as an intricate weaving of life, he perceived man as a part of the fabric. As a forester/ecologist, he, along with many of today's social psychologists, have recognized the need of man and society for a strong link with their cultural and ecological heritage.

Man cannot remain physically, mentally and spiritually well by living only in the present; he must have a tie with the past if he is to reach into the future. And without personal committment to the entire spectrum of his heritage, he fails to

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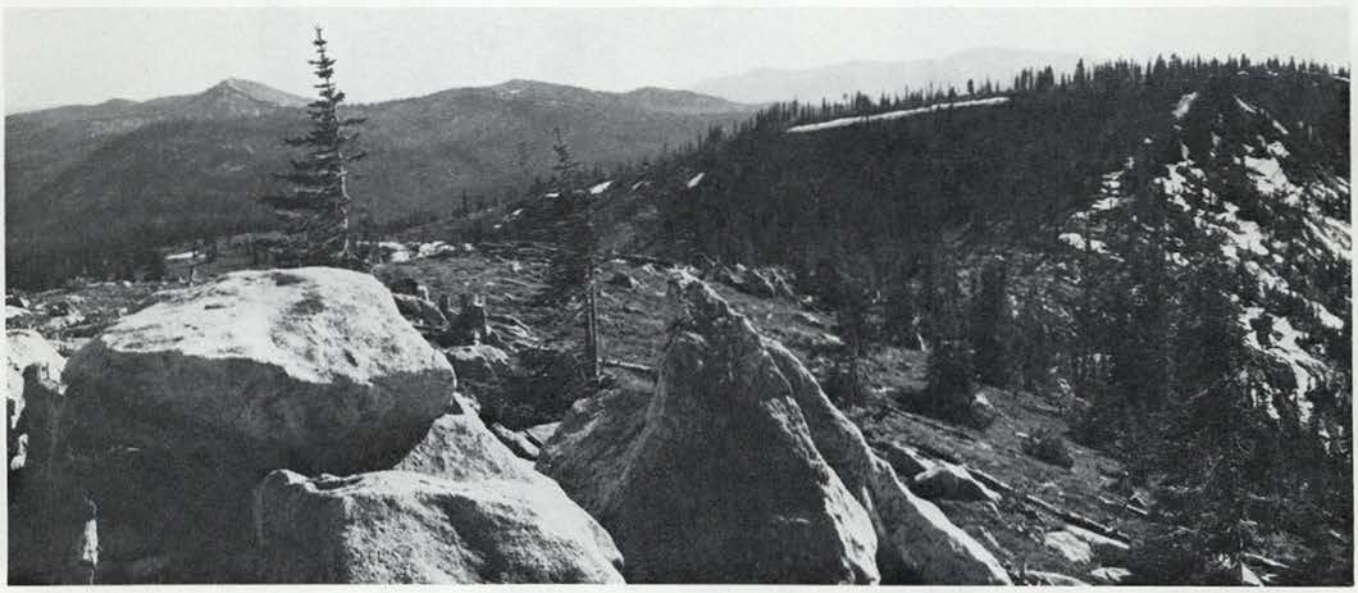

MAN-A HARMLESS VISITOR?

James R. Fazio

Ed. Note: for author information see New Faces section.

Most of us would agree that it is blindly unrealistic to believe that once an area is established in the National Wilderness Preservation System, man thereafter is a harmless visitor and nature reigns supreme. In wilderness we find not idyllic islands in a sea of civilization, but instead magnetic resources giving rise to a recreational upsurge of phenomenal proportions.

To illustrate the situation, consider that in the first decade since passage of the Wilderness Act, more than six million Americans have quadrupled the ranks of wilderness backpackers. In their wake, we witness the unfortunate paradox of having to face a plethora of management decisions for lands which, in concept, were to be sanctuaries from manipulative management.

We find the administrators of these lands grappling with the problem of how to prevent physical deterioration of a resource base while at the same time protecting the visitors' rights to solitude, freedom of movement and other amenities of wilderness recreation. The result has been a growing number of rules, mandatory permits and even the restrictive procedure of use rationing.

Many of the direct management measures would be unnecessary, at least in Idaho for many years to come, if an aggressive educational campaign were aimed at wilderness recreationists.

The need for education as a management tool was recognized as early as 1962 by the Outdoor Recreation Resources Review Commission. In its report to Congress and the President, it stated, "Inappropriate and destructive wilderness recreation is frequently due to inadequate skill and knowledge."

The commission also pointed out that very little effort was being directed toward improving these "critically weak aspects in the use of wilderness areas." The resulting recommendation — little heeded to date — was for government agencies to develop "enlarged public education programs" related to acceptable modes of behavior within wilderness areas.

If our proposition is true, that wilderness **can** be protected from the harmful effects of human visitation if visitors are taught to conduct themselves in certain ways, then our first problem is deciding what to teach. If a list of specifics were drawn up to answer this question, probably no two people would agree on what to include, let alone which items deserve priority. However, I believe we can label the substance of the needed list as "techniques for low impact camping."

The concept of low impact camping is quite simple and certainly not new. Basically, it is camping **sans** evidence of your visit; living in harmony with the wilderness environment rather than clashing with its various resources.

An early proponent was conservationist Paul Petzoldt of

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SEARCH, SEARCH, RESEARCH

STREAM SEDIMENTATION — SOME ANSWERS TO THE PROBLEM

Robert Klampt

Solid materials enter a stream mainly through run-off, erosion and landslides. Once in the stream, solid materials either remain in suspension or settle to the bottom. The material that settles to the bottom is termed bedload sediment.

Some introduction of solids is natural, but the rate of solids introduction may be increased by disturbances of man.

Improperly-located and constructed roads increase landslides and thus solids in a stream, possibly to a greater extent than logged-over areas. Burns caused by nature or man increase run-off, erosion and landslides, especially when accompanied by improper land management practices.

Over-grazing of grasslands can also increase run-off and erosion. Improper agricultural practices increase the potential for excessive run-off and erosion.

Increased run-off resulting from any of these disturbances on a large scale can produce flood situations. Floods increase solids introduction into a stream, and also increase the capacity of the stream to carry solids.

The extent to which erosion and landslides occur and their relative effects is a function of the watershed of a stream. The gradient of a stream (drop in elevation per longitudinal distance along the streambed) determines its velocity and thus its ability to scour and carry solids.

Robert Klampt is presently working towards a M.S. in fisheries resources at the university. His hometown is St. Anthony, Idaho.

By the same token, the steepness of the canyon in which a stream is located determines in part the erodability and potential of solids introduction. Differing soil types also influence the erodability of a slope.

A high gradient stream, such as one found in a mountainous headwater region, has both a high capacity for solids transport and a high potential for erosion and landslides. This type of stream generally forms either a U-shaped or V-shaped canyon. Any disturbance of the watershed in such a situation could result in accelerated erosion and occurrence of landslides.

A low gradient stream, on the other hand, has a low capacity for solids transport (higher rate of deposition) and a varying potential for erosion. Solids entering a low gradient stream are of more concern due to a low capacity for transport of sediment, creating a higher rate of sediment deposition.

These concepts can be applied to a single stream, following it from its headwaters to its mouth. In the headwaters, a stream is generally high gradient with a V-shaped canyon, slowly grading into a U-shaped canyon. As the gradient lessens, the canyon opens into a valley.

Solids entering such a stream in the headwaters would be transported, being deposited at a greater rate as the stream gradient lessened. The potential for solids introduction would also lessen with the change in topography from a steep canyon to a wide valley.

The effects of solids entering a stream may be divided into two main categories, the impacts on the stream channel itself and the impacts on the aquatic life. Excessive solids in a stream cause the stream bed to become graded or level. The transport of solids also causes increased scouring of the stream banks. This process tends to introduce even more soil into the stream.

The effects of solids on aquatic life in a stream can be direct or indirect. Direct effects are those influencing aquatic life at the time of solids introduction and indirect effects are long-term effects.

Solid materials moving with a stream can cause distress to fish and acquatic insects, abrading and even cloggging the gills. The material moving along a stream bottom dislodges aquatic insects, reducing food organisms available for fish.

Suspended solids decrease light penetration and angling success in a stream. Sediment deposited on the stream bottom can cover bottom-dwelling organisms, reducing their numbers. This sediment fills the spaces between the gravel, reducing the habitat available for those organisms living in the gravel. The permeability of the gravel is also reduced, suffocating incubating fish eggs.

The long-term effects of excessive sedimentation are a reduction in the survival, abundance and growth of fish.

During the high water period of 1964-65, flood conditions occurred on the South Fork of the Salmon River in Idaho. Following this flood, some riffles in the Poverty-Oxbow area were covered with up to two feet of sand, and pools 10 to 15 feet deep were filled with sediment.

In 1967 the U.S. Forest Service estimated 92,000 cubic yards of sediment entered the South Fork, 25 percent of which

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REVEGETATION OF MINE SPOILS

Ed Pommerening

The vegetation in the Coeur d'Alene mining district in northern Idaho was initially destroyed by forest fires in 1910, 1924, 1933 and 1945. Uncontrolled sulfer dioxide (SO2) emissions from one of the nation's largest lead and zinc smelter complexes, located in Kellogg, have since prevented natural revegetation in the area.

As technology increased in the field of controlling SO2, new equipment was added to the lead smelter and zinc plant to reduce emissions. With these reduced emissions, revegetation of the denuded sites became feasible.

Reclamation began in the spring of 1972. Three approaches were taken: chemical analysis of mine spoils; survival and growth experiments in the greenhouse on grass and legume species; and establishment of field species screening plots, including trees and shrubs along with the grasses and legumes.

Two general types of spoils were found which had to be dealt with separately. The slopes surrounding Kellogg were the dominant problem because they are completely barren. Chemical analysis of the soils showed high amounts of lead and zinc and low amounts of nitrogen, phosphorous, potassium and calcium, along with a low pH.

Tailings were the second type of spoil. These are sand size particles left after the extraction of the desired metals. In early mining practices the tailings were dumped into the Coeur d'Alene River and its tributaries. Tailing ponds are now established close to mills in order to hold the wastes and prevent further pollution of the river.

Ed Pommerening received a B.S. in plant science from the U. of I. in 1969. He is presently completing work on his M.S. in range resources where his thesis is focused on mine spoils revegetation. His work is being financed jointly by Bunker Hill Mining Co., and by the University of Idaho.

Numerous deposits of the tailings remain along the flood plain with little or no visible vegetation. Tailings are typically very low in nitrogen, phosphorous, and potassium. Due to the sandy loam nature of the tailings, water retention is very low. This requires a re-wetting of the area while the seedlings are emerging.

Soil was collected from the two types of problem areas, taken to the greenhouse, and planted with several species of grasses and legumes. The tailings were found to support plant life if nutrients were added. Without nitrogen and phosphorous, plants germinated but were unable to survive and grow.

In certain types of tailings, heavy metals were present in relatively high amounts. This was probably due to an earlier method of mineral extraction which was abandoned in the early 1900's for the more efficient present method. The heavy metals didn't seem to inhibit germination but young plants were sometimes spindly and the growth rate was slower than in the tailings with a lesser amount of heavy metals.

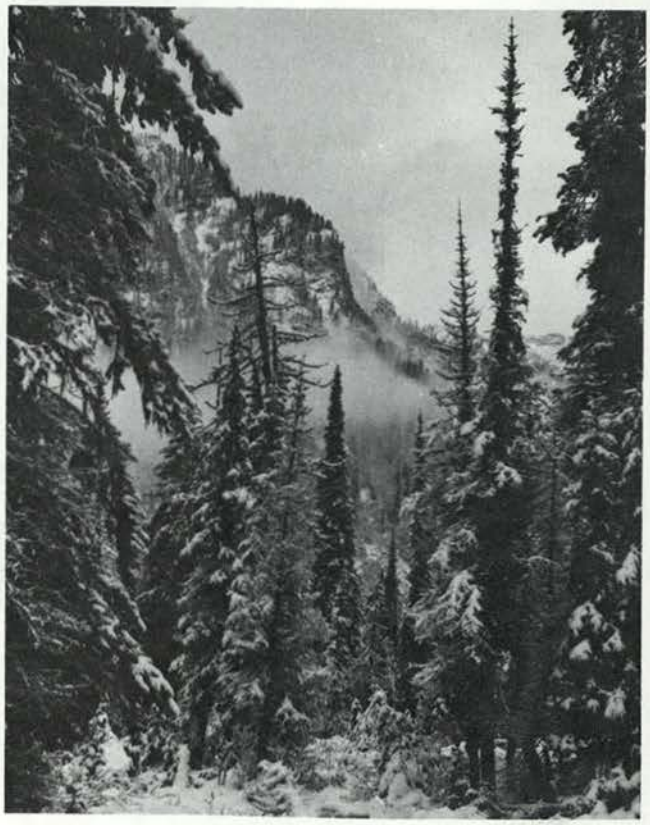
The soil from the slopes surrounding Kellogg exhibited results similar to the results from the tailings with high amounts of heavy metals. Plants seemed to germinate well but growth was retarded and the plants would die after two weeks.

In field plantings, where water was available to the emerging seedlings, several grass species were found to grow on the tailings with the relatively low heavy metal contents. Trees and shrubs responded almost identically to the grasses. They grew well on the lower metal content spoils but on the higher heavy metal content spoils they only broke bud and grew until the root reserves were exhausted. No root elongation was found on any of the dead plants. Death occurred two weeks or less after the buds broke.

New planting techniques, including containerized seedlings, were tried on the high heavy metal spoils. Survival and growth was more successful as a result of this technique. A more thorough soil analysis revealed that in both the heavy metals and slope soils the heavy metals and low pH were only in the upper strata of the profile. The native soil below the tailings and the soil below twelve inches from the slopes had a higher pH and reduced heavy metal content.

Research is still being carried on with containerized seedlings. Early results show that once the plant gets its roots into the lower strata of the soil profile, survival is possible.

Although this is a very small picture of the overall problem, success may be possible in revegetating the entire valley if research is continued. The mining companies are applying the knowledge gained in implementing a large scale planting program, thus bringing this large land mass back into a multiple use area.



MULTIPLE RESOURCE BASE

Traditionally, the Forest Service has regarded a ranger district as a multi-resource land base. Northern Region districts generally range from 200,000 acres to 500,000 acres in size. Some in the Forest Service believe that only portions of a ranger district "will be used for less than all of the resources."

If there is anything to the view that Forest Service land use plans are predictable, it perhaps bears on an implicit assumption that ranger districts are National Forest microcosms. They are expected to be administered for all the multiple uses, i.e., outdoor recreation, range, timber, watershed, wildlife and fish purposes. The most productive lands are expected to "furnish a continuous supply of timber for the use and necessities of citizens of the United States,' and the most scenic areas are to be managed for outdoor recreation or wilderness.

A friend of mine, not particularly a critic of the Forest Service, calls this the "Alternative 'C' Syndrome." This presumes that Alternative "A" calls for wilderness management over most of the area, and Alternate "B" provides for management that emphasizes the production of tangible products such as wood, water and forage.

The Alternative "C" Syndrome is perhaps nurtured in Forest Service Manual reference number 8213 calling for land use "plans of management that represent appropriate mixes of uses and activities responsive to Forest Service objectives." Thus, if the statement were in fact applicable to all ranger districts, the "Syndrome" would exist.

Let us turn to perceptions of Forest Service goals and objectives within the Forest Service family. For many years the profession of forestry was essentially the only profession represented in the Forest Service. This has changed significantly in the last ten years.

The definition of forestry has undergone a metamorphosis. Gifford Pinchot wrote that "Forestry is Tree Farming. Forestry is handling trees so that one crop follows another." In 1944, the Society of American Foresters (S.A.F.) defined forestry as the scientific management of forests for the continuous production of goods and services.

Twenty seven years later in 1972, the S.A.F. redefined forestry as "the science, the art, and the practice of managing and using for human benefit the natural resources that occur on and in association with forest land." The changing needs of society are mirrored in these different perceptions of the forester and his role.

APPROPRIATE MIXES

The Alternative "C" Syndrome applied uniformly to every ranger district and every planning unit could be a pitfall to planners. It could result in a blind allegiance to the untenable proposition that there should be multiple uses on every acre of National Forest land.

The National Forest System is highly diverse and there is much local color and character in each of its 154 National Forests and 19 National Grasslands in 41 states and Puerto Rico. The "appropriate mixes of uses and activities" described earlier as Alternative "C" thus recognizes that "some land will be used for less than all of the resources."

There is an optimistic view of National Forest management which sees the various resources and uses as being basically in harmony with one another. When conflicts arise they can normally be resolved through negotiation. In the unusual instances when negotiations fail, the "highest" forms of land uses are expected to prevail.

We will say more about how these "priority" land uses are determined at a later time. Compromise and accomodations are the twin building blocks of this optimistic view of resource allocation. The "optimum" plan is brought forth after hard negotiations between opposing points of view, both internally and with the public. To many, the optimum plan is an intrinsically good plan.

RESOURCE ACTIVITY LOSS

A more pessimistic view of management focuses on each resource or activity loss as the result of accomodation. For example, when scenic roads traverse highly productive timberlands, the optimum plan may decrease the yield of commercial timber. Likewise, when a highway crosses a primitive mountain range, the optimum plan may result in a decrease in solitude and a consequent loss of appeal for primitive-type management. Optimum plans are perceived by many as a dilution of quality management and as politically motivated.

While land management choices are narrowed by legislation, hard choices still remain to be made on specific areas of land. The land use planning system adopted by the Forest Service establishes a hierarchy of planning flowing between the Chief and the regional foresters, and between and regional foresters and the forest supervisors.

Inasmuch as the Forest Service is a decentralized Federal agency, local managers have been delegated responsibilities for making on-the-ground decisions within the framework of established policies. Thus, intimate knowledge of on-the-ground conditions by local managers is eventually reflected in the Chief's policies in such documents as Framework for the Future the Regional Forester's Management Direction for the Northern Region and in on-the-ground planning.

PRIORITY OF RESOURCES

Closest to the ground in the planning hierarchy are the Forest Multiple Use Plans. Part one of the plan assesses the forest situation as a whole and prescribes means for coordinating the various uses and activities within the National Forest. Part one does not specifically establish the priority of resources on individual parcels of land, unless these have already been established by law or regulation. The Selway-Bitterroot Wilderness and the Mallard Larkins Pioneer Area are two examples in the Clearwater National Forest.

Part one provides for the division of the forest into smaller planning units. These smaller units are somewhat homogeneous tracts of land, organized for the purpose of study and eventual land allocation. In this manner, part two of the Forest Multiple Use Plan evolves and consists of a composite of land use decisions made during the unit planning process.

LAND ALLOCATIONS

How are the land allocations made? Before attempting to answer this question, I would ask the reader to keep in mind that all National Forests or regions do not approach land use planning in precisely the same manner. The philosophic approach is the same, but the actual land allocation methods differ in detail.

In the Northern Region some of the forests are using a system of "conflict resolution" which has been refined by the Idaho Panhandle National Forests' planning team in Sandpoint, Idaho. The Clearwater National Forest is also making use of this resource allocation system.

It has as its foundation a technological base, i.e., resources are evaluated by technical specialists primarily in the natural science fields. Each specialist, regardless of his specialty, evaluates the planning unit for its capability and suitability to produce the goods or services related to his specialty.

Following this inventory process, the capabilities and suitabilities for every identified resource or amenity are given numerical ranks, using a rating system of one to nine (one is low ranking; nine is high). If more than one resource has a high rating on a given landform, this signals a possible conflict and the planning team specialists must evaluate the significance of the conflict. Minor conflicts are resolved by agreement among the specialists and methods are suggested for alleviating the conflicts.

For example, if the harvesting of diseased timber conflicts with the peak summertime use of a campground, the timber may be harvested in the off-season. On the other hand, if an area ranks high for a research natural area and also ranks high for a major ski area development, the conflict can only be resolved by a deliberate choice of one land use over the other. These choices become individual land use alternatives, commonly referred to as Alternatives A, B or C, to differentiate one from another.

It is obvious in evaluating this system that technology has failed to provide us with a solution to our land allocation problem. We had hoped that the "optimistic" approach of compromise and accomodation would yield the right management plan. It has not! Now the "highest" form of land use must prevail. But which land use is it to be?

The National Environmental Policy Act does not prescribe how to make a decision when there is more than one alternative to choose from. It does require that Federal agencies go through an orderly and visible process before coming to a decision. The "highest" form of land use is dictated by one or several of the following: (a) the relative geographical scarcity of commodities; (b) the attitudes of the local, regional and national publics; and (c) the relationship of the land unit to the region.

MANAGEMENT ALTERNATIVES

Let's examine the three somewhat unrelated criteria that lead to the selection of a land management alternative.

(a) **Geographical Scarcity.** A list of resources and commodities which are believed to be significant is developed during the planning process. It may be determined that the planning unit is one of the few locations in the United States or in the world in which a certain mineral may be found. The unit may also contain the habitat for an endangered species of wildlife.

Usually, however, planning units include a variety of resources which are neither in abundance nor short supply nationally. Locally, the individual resources may be significant, but not nationally. If this is the case, it may involve weighing the merit of selecting a plan which is needed to support the vigor of a local industry.

(b) **Public Attitudes.** National Forest management requires a sensitivity to public opinion, whether on the local, regional or national level. Public opinion polls, public meetings, "listening sessions" and person-to-person contacts are all used to assess public attitudes about planning units.

Not all people are to be involved in the details of land management. They do care, however, when a use to which they have become accustomed is denied them, when certain resources are in short supply or become expensive, or when the threat of change affects their livelihood or lifestyle. When there are choices in land allocation, strong and widely held views are key factors in making decisions.

(c) **Relationship of Unit to Region.** Although planning units are delineated because they appear to be homogeneous and identifiable units of land, there is no escaping the fact that a strong relationship exists between the region and the planning unit. On the Clearwater National Forest this mutual dependence is best exemplified by the migrations of anadromous fish from upstream spawning gravels to the Pacific Ocean and their return.

Also, in North Idaho, the economically important timber industry is dependent on a predictable level of timber harvesting on the National Forests as a whole. Although elimination of a source of timber on a small planning unit is not a significant threat to the economy of North Idaho, the cumulative effect of withdrawing timber from many planning units would be significant.

Likewise, the impact of changing the habitat on a planning unit to the detriment of the local elk herd may not be a significant threat to the total elk population. However, the cumulative effect of a diminished elk habitat on many planning units would be significant.

As of this date, no precise cause and effect relationships have been established to assess the relationship between the planning unit, regions or even larger geographic areas. Until sound data is available, the manager will undoubtedly be very conservative in making resource allocations. The Forest Service is presently undertaking a study of the North Idaho area to attempt to place these relationships in perspective. The results of this study will be published as the North Idaho Planning Area Guides.

CONCLUSIONS

Is there really an Alternative "C" Syndrome in National Forest land use planning? I would venture a qualified "yes." Until and unless the Congress more nearly expresses an Alternative "A" mandate or an Alternative "B" mandate, the optimum plan or that plan which results from hard negotiation, compromise and accomodation will continue to typify Forest Service land use planning.

Part of the reason for this appears to be that Alternative "C" is the legal balancing point required by the many legislative acts governing the National Forest System. I qualified the "yes" because truly unique resources have been given and continue to be given special recognition and management by the Forest Service.

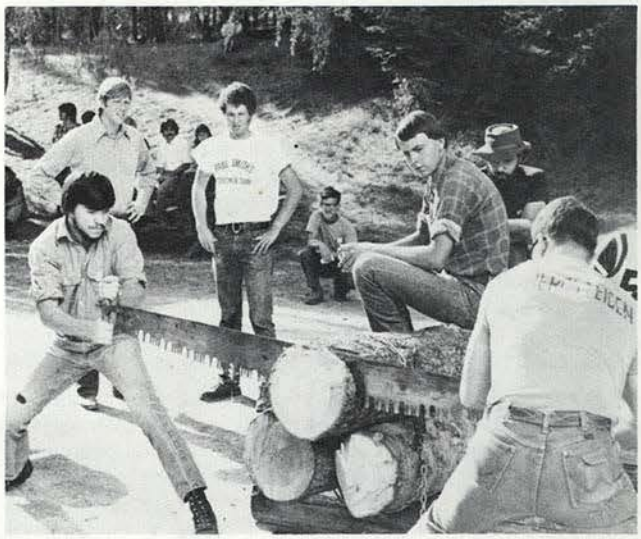
Compromise in itself is not a virtue. Only when compromise is coupled with reason does it make sense as a land ethic.

Ables **continued**

Highly qualified instructional personnel in the proper subject matter areas are essential to any educational program. The college has as a major goal — excellence in teaching with the student and his education placed in high priority. Emphasis has been placed on employing faculty who have proven themselves as outstanding teachers or who have demonstrated potential to develop into good teachers.

Selection of faculty are carefully considered so as to maintain a balance between general ecologists in the one hand and specialists in subject matter areas essential to specific disciplines on the other. For example, the forest resources faculty has silviculturists and mensurationists, but also specialists in genetics, tree diseases, systems analysis, remote sensing, soils and hydrology, to name a few. Other program areas in the college are staffed in a similar manner.

What kind of person is the forestry student who is going to become the future resource manager? An examination of the records reveals some interesting and pertinent facts. A large proportion of forestry students are non-residents and/or transfers from other institutions. By the time this kind of person finishes his education he will have been exposed to several



different social and educational climates. Such a person is likely to have a better perspective of events and situations than the home-body.

Forestry students at the University of Idaho have the lowest average gradepoint ratio of students in any college on campus, but are third from the top in scores in college entrance examinations. Why this seeming contradiction?

The answer is two-fold. Forestry students have a difficult curriculum. Because of the educational requirements of all present-day foresters (which come very close to the educational needs of the integrated resource manager), the curriculum includes courses in many disciplines. The forest resources student, as well as all others in the college, must take classes in calculus, statistics, modeling, computer programming, communications, writing skills, economics, chemistry, physics and at least two natural resource courses outside his major, to say nothing of required courses in forestry. Few people can excel in all of these disciplines.

The second factor is the high standards demanded by teaching faculty in the college. They know what will be demanded of the forestry graduate and are determined that false impressions of easy achievements are avoided. Few things worthwhile come easy and this applies to management of natural resources too. Developing a prescription for a forest stand requires the highest level of professional expertise. If a mistake is made the consequences may haunt one for half-a-century or longer.

Content and design of the undergraduate curriculum in forest resources at the University of Idaho compares well with those in any forestry school in the United States. The forest

resources management option is particularly well designed to meet the needs of the integrated resource manager. Much of the content has been discussed previously. However, I would like to point out a particular strength of this, and all other curricula in the college.

Integration of information and knowledge from many disciplines in order to make a land use decision requires that one consider all potential factors, their degrees of compatibility, and the costs and benefits of different combinations over time. Much of this essential knowledge and training is provided by our two required courses in Models for Resource Decisions and by an elective in Land Use Planning. I don't wish to imply that we are producing experts in this area, but at least our graduates have an appreciation for what is involved.

What has been mentioned thus far is aimed particularly at the forest manager and the examples pertain to integrated management of forest resources. However, similar statements are valid for each of the six program areas in the college. They are all pervaded by the philosophy of integrated and multidisciplinary approaches to natural resource management regardless of whether the resource is wildlife, range, fish or timber.

We believe our students have an outstanding education in the scientific disciplines central to their fields of endeavor. We also believe they have something more, something unique to our college. This something is a special appreciation for total resource management, an attitude of concern for a tree, songbird, a river or a wilderness experience. This attitude is fostered by the overall goals and objectives of the college and their implementation in the teaching and research programs. Our students may be specialists but their speciality is "putting it all together."

Noh continued

Another plague on the decision maker is the difficulty in determining whether or not the public input he receives is, in fact, representative of the public wishes. Every organization, whether conservationist or commercial, has learned by now how to stack a hearing. At least a hundred letter writing campaigns are organized every day across the nation. So the real question is, do these letters or this testimony really represent the public wish?

No doubt, those brave souls who must bear ultimate responsibility for the decisions made have learned to gauge the worth of letters and testimony in direct proportion to the ability of the organizers to turn it on. Nevertheless, I believe, an analysis of most public input will reveal that important segments of society are left out—the lower income groups and unorganized minorities.

Most public pressure groups in the area of land management are supported by upper or upper-middle class wealth and rely heavily upon the volunteerism which flows from leisure time. But who testifies for the citizen who must devote all of his time working to pay the family bills? He will never join the Sierra Club or own stock in Georgia Pacific, yet both may say they represent him.

Western livestock interests may convince federal administrators of the need for an emergency program to use toxicants to protect domestic animals from coyotes. But the poultry grower with less clout can be put out of business by the same animal or others and no program is offered to help him.

There is a need for a better sampling of public opinion than conventional public hearings or the measurement of two stacks of differing letters. The problem should be worth the time of academic institutions and those who must make the decisions.

Continued on Page 36

RIVERS and TREES . . .

are more than beautiful scenery!

They are part of the better life that we all seek.

They mean a healthy basic economy that provides fulfilling careers for the citizens, security for families, opportunities for the young.

The blessings of a beautiful, healthy outdoor environment and a continuing source of energy and materials are equally essential to a high quality of life. Both must be cultivated and preserved.

Fair minded people, working together in the interests of all can meet this goal.

THE WASHINGTON WATER POWER CO.

Clean Energy for Better Living

Invariably resource management benefits from decisions based upon the best available facts, combined with inevitable judgments about which are, indeed, the best facts and which are the best choices among several supported by the facts. Western civilization has long recognized the cultural imperative of determining "truth" and "right." We have evolved complex sets of rules for the discovery of truth and the determination of right. The task of administering and guarding this sacred system falls upon the judicial branch of government.

Perhaps it is here that we should turn for lessons in integrated management decisions, especially when the variables are not easily quantified. The law has rules, for instance, about who can serve as expert witnesses when questions of scientific fact are at stake. They have measures for determining how much one man may be hurt by another's acts. They have rules about hearsay evidence. Resource management confronts the same dilemmas as a federal judge and, perhaps, could adopt some of the same tools and rules.

This paper has no simple solutions to offer. Rather it contains the thoughts of one who has wrestled, strictly as a neophite, with resource management for the past two years. Some bad decisions have been made, that I know. The public input dimension of our decisions is relatively new and increasingly intensive. Maybe these thoughts will stimulate exploration of the problem areas which have led to the bad decisions, so we might make fewer errors in the future.

Johnson continued

over time. The advantages of simulation relate to its understandability, its realism and its ability to handle large problems.

However, simulation is not an inexpensive management tool and it does not yield optimal solutions. Though the solutions are not optimal, several alternatives can be tested and their solutions can be used in a decision making process.

If the land use model could be programmed and then could be shown to be valid, it would allow the decision maker to test alternative land use strategies, to analyze the projected impact of those decisions, and to choose the best strategy. For the model shown, these strategies would be changes in the regulation and control segment of the model.

A problem the size of a detailed land use system poses many modeling problems. It may not be feasible to construct a mathematical model of the entire process. However, the framework developed in a detailed flow chart might point to specific critical areas that could be studied on a smaller scale.

The decision maker might study one or two individual system interactions and then use the results of this smaller modeling effort as input to his overall decision. The smaller modeling efforts might lend themselves to some modeling technique other than simulation.

There is always a dilemma in describing a system and setting up a model of that system. The description of the system must be selected to include enough detail to be realistic, but not so much detail that its size makes it impossible to handle. This description process represents one of the most difficult decisions a planning or modeling team will face.

Planning for effective land use will always be a difficult task. Models, both conceptual and mathematical, can greatly facilitate the process. Models force planners to look very closely and explicitly at the problem; explicitly because interrelationships must be thoroughly understood if they are to be transformed into mathematical functions. Secondly, models are generally better than intuition at assessing management alternatives. Finally, the models allow the planners to explore planning opportunities in a fashion that otherwise would not be possible due to time or cost restrictions.

These advantages tend to overshadow modeling limitations. The primary limitation is the difficulty of incorporating human desires and reactions into a mathematical context. Another is associated with inadequate data bases or gaps in our knowledge of the system. However, models do show us gaps that might otherwise go undetected.

A third limitation stems from difficulties involved with keeping a group of individuals with diverse backgrounds functioning as a team. Another disadvantage relates to the difficulty of making assumptions and limiting model use.

As you can see, most of these limitations are going to hinder the planning process whether or not a modeling approach is undertaken. The problem framework provided by modeling, if properly applied, greatly facilitates problem definition and communication in land use planning.

Bunnell, F. "Large Scale Resource Models," mimeographed paper. University of British Columbia, 1972, 17 pp.

Forrester, Jay W. "Counterintuitive Behavior of Social Systems," Technology Review, January, 1971, pp. 53-68.

Jeseski, James J., et al. **Impact of Large Recreational Developments Upon Semi-Primitive Environments — an Overview,** Research Monograph No. 1, Center for Interdisciplinary Studies, MSU, Bozeman, Montana, 1973, p. 24.

Wilson continued

tremely hazardous to the dogs. Shooting from helicopters or fixed-wing aircraft during these periods can also be a safety hazard to hunters and hunting dogs. Therefore, calling and ground hunting are the only predator control methods which can be safely used during many hunting seasons. Intensive predator control programs, particularly for coyotes and/or wild dogs, will have to be designed to consider hunters and hunting dog safety.

Except under extreme emergencies, no predator control programs should be undertaken in or adjacent to cities, towns, highways, major county roads or high use recreational areas. Predator control methods pose a hazard to house pets and small children. Children and house pets play in the country adjacent to cities and towns regardless of the season of year. People stop along highways and major county roads for vehicle repairs or to exercise their pets. Therefore, any predator control program, regardless of season, could be a public hazard.

High use public recreational areas where fishing. camping and sightseeing are important land uses in the summer may or may not be the same as those heavily used by rabbit hunters, snow machine riders and skiers in the winter. Predator control in these areas, if determined necessary, would have to be conducted during the off season, depending upon the recreation use and season involved.

Another aspect of predator management and land use planning is identification of areas of suitable habitat or potential conflict areas for endangered and threatened wildlife species. Grizzly bears and wolves in the lower 48 states are two examples which require special consideration, both are classified as "threatened" by the U.S. Fish and Wildlife Service.

Grizzly bear-human confrontations have been documented on several occasions. In general, the higher the use of an area by the public and the higher the density of grizzly bears, the greater the probability of grizzly bear-human confrontations. Regardless of the decision of whether to introduce, maintain or enhance grizzly bear numbers, or improve recreation opportunities or use, controls on one or both have to be determined.

The introduction of wolves into areas grazed by livestock, or livestock introductions into areas of known wolf populations, will ultimately lead to problems. On Isle Royal in Lake Michigan, 15 to 16 wolves averaged killing one moose every 3.0 to 3.7 days (Mech, 1970). It does not take a great deal of imagination to realize what would happen to a domestic sheep or cattle population if a viable wolf population were present in any area.

Confrontations between wolves and livestock are not problems of the past but still persist today. In Washington, a wolf which was believed to have killed three cows in a 20-day period was shot January 5, 1975 (Idaho Statesman newspaper).

When preparing land use plans integrated with predator management, personnel of Animal Damage Control (USF and W), the state wildlife conservation department, other land management agencies, and county agents should be contacted. They can be most useful in identifying past predator depredation problem areas and areas where little or no depredation has occurred. Once these localities and the aforementioned considerations have been made, land use planners can identify (1) areas where no predator control except under emergency situations will be conducted, and (2) areas of probable predator control.

Next, the most probable and feasible uses of a given area of land can be delineated and possible conflicts with predators identified. Once decisions as to the various uses and/or resources to be managed are made, areas of predator control and areas of no control can be further refined.

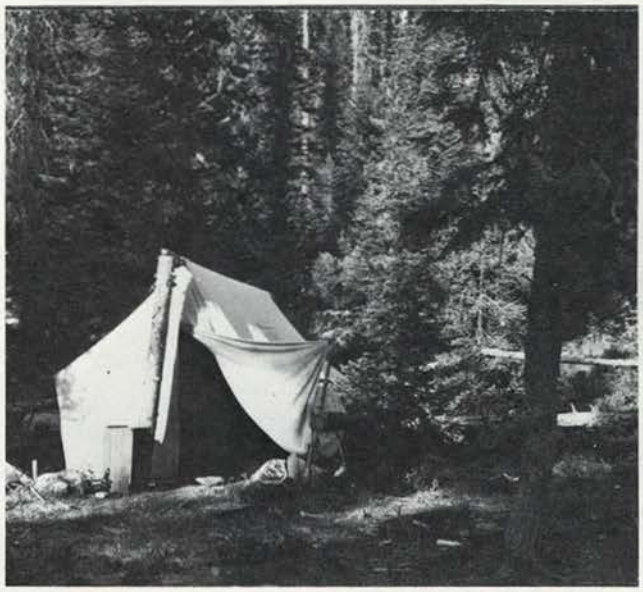
Those areas in which predator control will be permitted then must be analyzed as to time of year, methods and intensity of control which will best provide public safety. At this point assistance from wildlife biologists, ecologists, professional game managers and field assistants of the U.S. Fish and Wildlife Service should be requested.

In the event the decision is made that no predator control will be permitted within a given area, the planning process does not end. Emergency predator control may be necessary for the protection of human safety such as a rabies outbreak, or for the protection of endangered or threatened wildlife species.

Therefore, any land use plan should include a course of action should an emergency arise. Some of the items that should be considered are: notification of the news media to inform the public of the hazards involved; the name, address and phone numbers of qualified individuals capable of carrying out the control program; and signing of the area, if necessary, to warn the public of the hazards.

Predator management programs based on sound land use planning must remain flexible as land use plans must be periodically updated. Currently, research to develop new techniques to better manage predator populations or to reduce impacts on prey species populations, particularly livestock, are being investigated by the Denver Wildlife Research Center, U.S. Fish and Wildlife Service. As new techniques are developed, land use management decisions and programs may need to be modified.

Predator management is one facet of land use planning that has been given little consideration in the past. Predator management programs may become a more important component of any land use plan due to increased predator populations brought about by changes in the philosophies and methods relative to predator control. Failure to consider predator management in land use planning can result in hazards to the public and/or hazards and problems with other domestic and wild animal populations.



Newby **continued**

reach all that he is capable of achieving. Therefore, the interweaving of man with the components of his ecological and cultural heritage becomes, or should become, a major concern of resource managers.

Interestingly, the United States is probably the only nation in which the wilderness frontiers are so recently close that they have not been forgotten. The memory of wilderness is imbedded so deeply in our present-day culture that to sacrifice this resource would in essence tilt the balance of our ecological and cultural heritage scale to a point that a significant element of our identity as a nation would be lost.

In the case of wilderness, the resource manager must decide when and how the artifacts of modern and ancient man become compatible with the spirit and intent of the Wilderness Act. In some instances the very fact that man lived and survived in the wilderness without destruction of that environment adds value and interest to the resource. Making decisions as to how much and what kind of intrusion is acceptable in a wilderness environment is rapidly becoming one of the more controversial issues facing public land managers.

Agencies charged with the administration of the

Wilderness System are rapidly discovering that "no management" is not a viable position to assume. People are discovering to an ever increasing extent the opportunities associated with the wilderness resource and with this discovery has come management problems unparalleled in any other resource management program.

To many, the involvement of those who have vested interests in the wilderness resource is either little understood or deemed unimportant. Nothing could be further from the truth. The people who have lived and died in or near these resources have helped shape this unique American resource. Prehistoric man, mountain men, homesteaders, ranchers, prospectors, outfitters and the more modern recreationist have all influenced the wilderness and each has played a role which must be undertstood as well as appreciated if "true wilderness"' is to remain a national heritage resource.

Professional resource managers who leave the hallowed halls of academia without ever having been exposed to the intricacies of man/environment interactions will find themselves woefully ill-prepared to carry out their responsibilities. If they go out with nothing but a consumptive-extractive-manipulative orientation, then their stewardship of the nation's natural and cultural resources will be a disappointment both to themselves and to those whom they serve.

How does one know whether he has acquired the necessary sensitivity for responsible management of natural resources? There is no standard. But I might suggest that unless you can empathize with a broad spectrum of the public relative to the values they derive from interaction with their "natural environment," you are not going to be as effective as you might be if such empathy had been obtained.

If you understand how an individual can have a "wilderness experience" in a few acres of city park as well as how the wilderness resource influences the whole of man to achieve self-understanding, then perhaps you are approaching at least a minimum level of sensitivity towards man and his interactions with natural environment resources.

A resource manager need not be a wilderness advocate, but he should have developed an environmental ethic which commits him to an holistic understanding of resource potential and capacities as well as man's needs and motivations. When such a committment is made, we may be able to understand the meaning intended by Aldo Leopold when he stated:

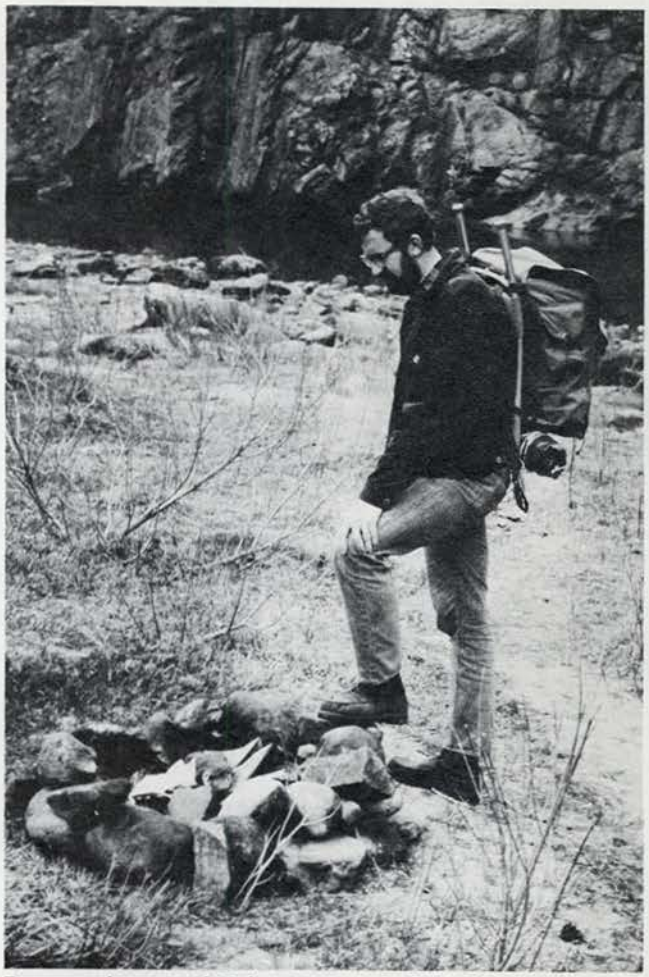
> "Ability to see the cultural value of wilderness boils down, in the last analysis, to a question of intellectual humility . . . . It is only the scholar who understands why the raw wilderness gives definition and meaning to the human enterprise."

Fazio continued

the National Outdoor Leadership School in Landers, Wyo. But today even the Boy Scout manual suggests burying the hatchet and pursuing less destructive avenues to wilderness enjoyment. Unfortunately, a review of agency efforts reveals a disappointing record of attempts to use the educational approach to wilderness management.

But again, what should we teach? As a starter, our list could begin by following the Boy Scouts' example of sparing green vegetation from onslaughts for bough beds, lean-to shelters, artificial clearings and the like. Careful site selection and the use of modern sleeping bags with foam rubber pads makes this unnecessary. Similarly, ditching around tent edges can be avoided.

Certainly we must take a fresh look at campfires. Sometimes more than 100 blackened rock rings may be found along the trampled shores of a mountain lake, many filled to the brim with yet another object on our list — litter. Education in the art of low impact camping can be used to all but eliminate these scourges.



Forestry alumnus Al Kyle views a rock fire ring. Techniques of low impact camping can be used to prevent this and other evidence of human visitatian to wilderness areas.

Proper human waste disposal, washing camp dishes without polluting the lake or stream, and the correct use of pack stock might also be the object of our educational efforts.

Some items on our list might seem rather radical, but must be considered nonetheless. One such item is the use of brightly colored equipment. While a flourescent orange streamer stored inside the pack (or worn during hunting season) is no less than prudent for safety purposes, bright tents, packs and jackets have the psychological effect of shrinking wilderness.

If colors that **blend** with the natural surroundings are used, more people can occupy the same visual space perhaps without even knowing of each others' presence, and certainly with less intrusion into each others' feelings of solitude or quests for natural beauty.

In almost every case, modern equipment lends itself to aiding low impact camping. All too often, however, instruction on wilderness camping becomes almost entirely focused on the relative qualities between one piece of equipment or another, or how it can aid the user's comfort. Why not place equal focus on how it can be used to protect the **wilderness**?

Portable stoves can eliminate the need for fire rings, but if abused, the cartridge-type can contribute to the litter problem. Foam pads elminate the need for bough beds; green tents shed

Continued On Page 40

water as well as bright red ones; tin foil does have dozens of outdoor uses (as Reynolds' advertisements proclaim in national magazines), but if left in the woods it will mar the environment for years.

The above examples are only the beginning of what amounts to an entire new ethic in wilderness use. The promotion of this ethic is the responsibility of everyone involved with land management, for wilderness constitutes a significant component of our western land base, especially in Idaho. Education is a legitimate and underutilized tool of wilderness management, and the time has come for its full application toward the goal of protecting the quality of our unique wilderness resource.

Thomas continued

This touches the broadest aspects of diversity and juxtaposition of habitat types, and the concept can be carried further in the treatment of each habitat component. For example, a forest composed of a few species in large even-aged stands is less diverse and will provide habitat requirements for fewer species of wildlife than a forest composed of many species of several ages, and in smaller stands interspersed with openings.

Fortunately, the diversity principle to insure a "fail-safe" position for nongame wildlife is compatible with land use planning in a dynamic frame. Change is neither good nor bad **per se** and, in fact, can increase and enhance diversity. Further, diversity and contrast of land form, vegetation and human use constitute the appearance and personality of the landscape, and are the very things manipulated by the landscape architect when he has the opportunity.

Diversity is nature's evolved safeguard against ecological disaster and, if considered and used properly in planning, can be man's shield as well. The most simple ecological systems are the most vulnerable to damage or devastation, and those most diverse are best protected. Man's enterprises are much the same.

The suitability of any habitat for man has been said to be reflected in the suitability of that habitat for wildlife. If you doubt that, compare a human neighborhood where the wildlife is characterized by sparrows, starlings, pigeons and rats with one whose personality is set by catbirds, robins, orioles and squirrels. In the first case there is little diversity, buildings are crowded and vegetation sparse. In the latter there are trees, shrubs, grass, in diversity.

This analogy can be expanded to the land use planning area. Consideration of wildlife values in planning can be a worthwhile objective and merely reflective of other good planning principles.

There is an old saying, "Variety is the spice of life." Variety (diversity) is also the spice that provides the requirements of myriad wildlife and a fail-safe principle for comprehensive land use planning.

Sullivan continued

Conceivably the problems lie in the failure to make use of differences rather than to try to deny they exist. Districts have received directives from above to hire a required number of females. Often women are hired for jobs with less screening as to their suitability for those positions as are males applying for the same jobs. The management decisions on what to do with these women are left to the District Ranger who has little knowledge of female capabilities in anything but secretarial work. To handle the problem, women are put into equal participation in almost all types of work. This leads to problems.

Few would argue that there are physical differences between the sexes. In assigning jobs possible physical limitations should be recognized. On the other hand, to assume that a woman cannot perform a task because its physical is equally detrimental. What's important is to plan work allocations so that all applicants are employed the most effectively.

So why then is there still surprise that women should be in forestry? Why is it so easily assumed that women in this field should have extraordinary motives compared to their male counterparts?

Women as well as men share a concern for their environment or a desire to make changes or aspirations toward a career. The new awareness many women in American society have achieved releases them from their designated role as homemaker and enables them to make a choice as to how they wish to direct their lives just as men have always done (although men too are subject to the subtle pressures of roleplaying). And women are making the choice.

"When I was in high school they kept after me to decide what I wanted to be when I 'grew up.' I looked at the secretaries and nurses and housewives in my community and decided to strive for something more outdoor oriented and challenging. Forestry fit the bill." (Stephanie Martin, junior)

Rather than posing a threat to the foundations of forestry, a great natural resource is only beginning to be utilized. The women who make the effort to attain a professional education in forest, wildlife or range management are pursuing the same sorts of goals as men who make the same effort. They are comparably capable and equally trained. What is needed most now is to let bygones be bygones and get on to the business at hand.

Marra continued

Equally important are the layering and orientation of elements during board formation. Heat delivery, heat transfer, pressure and pressure sequency add further levels of control. Throughout the manufacturing process, moisture content hangs as a pernicious factor ready to spoil properties by slight variations at any step.

With precise knowledge of these factors still minimal, it is amazing to observe how a wayward factor at one point in the process can be compensated by judicious modification of another factor at another point. In this sense, the manufacturing process becomes a delicately balanced ecosystem and its control requires fundamental knowledge of many "environmental" factors.

A third consideration is the properties of the material and their relation to use requirements. Much of what now constitute design criteria for wood structures is based upon knowledge of solid wood properties. The properties of engineered wood materials differ from those of solid wood in a number of ways, two of which are worthy of note here: (1) the controlled variation in properties in the three orthogonal directions; and (2) the uniformity of properties from piece to piece.

These two factors greatly expand the design freedom of the architect and engineer, but new design criteria must be developed in order to take advantage of the full potential of these new materials. The net result of improved properties and new design criteria is likely to be a reduction in the amount of wood used in structures, together with increased reliability in regard to performance.

For the reasons explained above, the practice of wood science and technology in the future will require more of the techniques so well developed and utilized by metallurgists and polymer chemists. Synthesis and process control are the key words for the future of wood and for the professional people who deal with the properties of this material.

Klampt continued

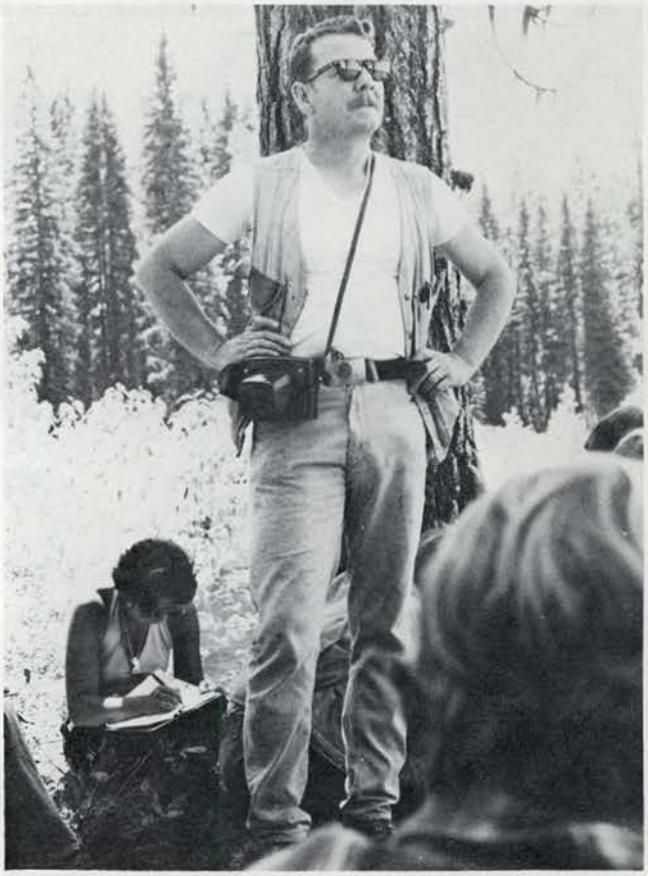
was natural and 75 percent as a consequence of roads, logging activities and burns. The South Fork is still ridding itself of excess amounts of sediment and should reach its previous state (prior to 1964) by 1980, if no more major influxes of sediment occur.

Studies on the effects of sediment in streams from logging in Northern California indicated a decrease in the size and number of pools. This decrease lasted over a period of 12 months following the cessation of logging activities, during which the stream recovered to its former state.

A decrease in the number and size of juvenile steelhead was also noted. However, in a watershed where precautionary measures were taken, such as a buffer strip of vegetation along the stream bank and the building of roads well away from the stream, detrimental impacts did not occur.

In a study I worked on in the Stanley Basin area during the summer of 1974, granitic sediment was artificially added to a section of a small stream. The effects of this introduction on the aquatic life were analyzed. The number of fish and insects decreased in the section where sediment was added.

Another segment of the study included the addition of sediment into artificial stream channels. As the sediment levels increased, more fish moved out of the channels. The channels left undisturbed maintained fish and insect populations above those of the test channels. Sediment resulted in a decrease in



numbers of insects and increased movement of fish out of the disturbed habitat.

Effective integrated land management is the key to reducing sediment loads in Idaho's streams. Farming practices are available to cut down on run-off and erosion. Over-grazing should be avoided, thus reducing damage to slopes and the potential for erosion.

Short-term logging activities are less deleterious to stream habitats because the stream has a chance to recover. Logging debris should be kept out of the streams. Such debris not only suffocates eggs in the gravel, but forms log jams during high flows, blocking the migration of adults to spawn.

A buffer strip should be established along stream banks. This reduces the chances of logging debris and other solids entering the stream. A buffer strip also provides shade, keeping water temperatures from rising above the tolerances of the aquatic organisms.

Disturbed areas of slopes should be seeded with grass to reduce run-off and erosion. Roads should be constructed on stable slopes well away from the stream. This lessens chances of landslides into the stream.

All of these management practices must be considered in light of the type of watershed in which a disturbance may occur. Soil erodability, the steepness and stability of the canyon, and the stream gradient must be taken into account when dealing with disturbances having the potential for introduction of sediment into a stream.

Integration of sound land management practices by all concerned is the key to the maintenance and enhancement of our freshwater resources. Following the management practices proposed in this article should reduce sediment-associated problems. Streams already damaged by sedimentation can return to their natural state if sound management is followed, and further damage need not occur.


MOOSE CREEK R. S.
CABIN
RHODA CREEK
BLUMS RANCH

New Faces continued

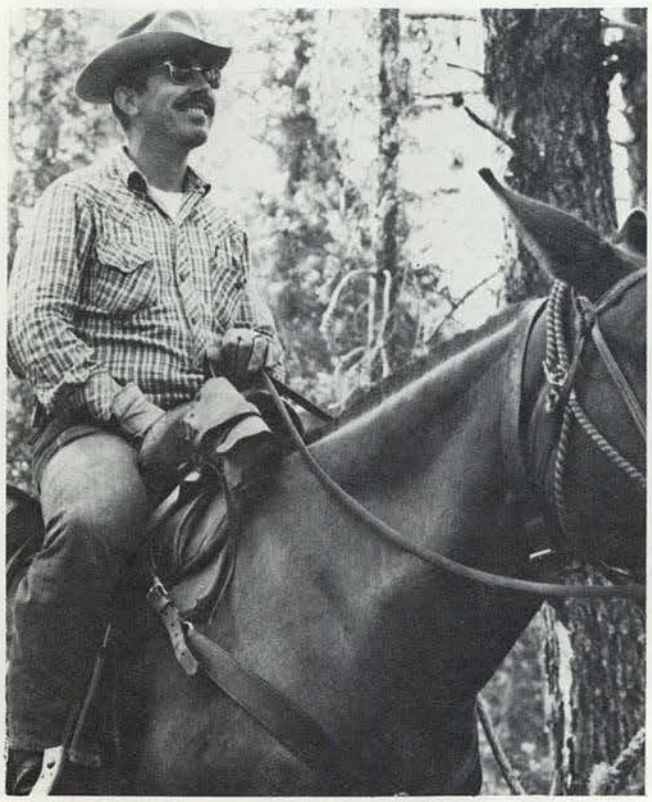
Dr. James M. Peek is an associate professor of wildlife management here at the college. Prior to this he worked for the Montana Fish and Game Department as a big game biologist dealing mainly with elk and deer. Dr. Peek received his bachelor's and master's degrees in wildlife management at Montana State University. He obtained his doctoral degree in wildlife management from the University of Minnesota where he was later an assistant professor in the Department of Entomology, Fisheries, and Wildlife.

Steven R. Peterson was hired for his expertise in waterfowl and non-game species. He is now an assistant professor of wildlife management.

Peterson received his bachelor's degree from Colorado State University and his master's degree in wildlife resources from Utah State University. He then spent two years with the Smithsonian Institution as an ornithologist stationed in Cyprus and Israel. Peterson is now completing his doctorate from the University of Wisconsin.

Lured from Missouri by the tremendous water and fishery resources here in the State of Idaho is **Dr. Robert G. White.** Dr. White is now an assistant professor of fisheries management and has also assumed the assistant leader position of the Cooperative Fisheries Unit here at the university. He will do research on stream alterations, stream flows, and differentiation of fish stocks as well as teach a graduate course.

Dr. White received his bachelor's and master's degrees in education from Northeast Missouri State University. He taught junior high school science and high school biology, chemistry and general science courses in Braymer, Missouri. Dr. White received his doctoral degree in fisheries biology from Utah State University where he was involved with fisheries research for five years working as a graduate research assistant.



Editorial continued

> "The **Idaho Forester** died in 1975 as a result of high printing costs and lack of sufficient support. The magazine was a long-time tradition of the college and we are all sorry to see it go."

Hypothetical? Perhaps, but it could and may very well happen. This year our printing costs jumped over 40 percent and they may very well do the same next year. The price for mailing—up 15 percent. In the foreseeable future the Forester may cease to exist.

While it may be good for some traditions to die, I personally feel that the loss of the Forester should not happen. The magazine has been published annually for over sixty years. It is unique in the nation. Many yearbooks are produced by students in forestry schools, but this is the only one where the focus of the magazine includes articles on resource management and research as well as student activities.

There are several alternatives that may be considered for the future. We could go to a strictly yearbook format — class pictures, club activities, faculty pictures, etc. There has been pressure in this direction from some students and faculty who desire more emphasis on student activities and student involvement in the college and see the Forester as one way to do this.

Another approach would be to abandon the publication as a function of the students and allow it to become a publication paid for by the college. The college would control the content, and money could be budgeted as an expense for publicity.

A third alternative would be to go on as we are now. Yet each year we devote more, and more expensive, space to advertisements and less space to articles. And there may still not be funds enough to continue publication. This year the price of the Forester was raised 33 percent and next year prices may be raised again.

The fourth alternative is to let the Forester die.

I personally would like to see the magazine continue as a publication of the students with the contents left to the discretion of the students. I would like to see the Forester continue to present articles on resource management and research as well as student activities.

To accomplish this will require the support and understanding of the students, the faculty, the alumni, our advertisers and subscribers. Help us promote the Forester. Subscribe to the Forester and buy one for someone else. Send us suggestions — they will be welcomed and appreciated.

I would like to thank our authors and advertisers this year and all those who helped in the production of this year's Forester. The cooperation that my staff and I have received has been heartening.

I hope you enjoy reading the Forester as much as I enjoyed being its editor.

Ehrenreich continued

groups lobby for differing objectives from forest and range lands, yet they all agree that all land uses and values must be considered in the land management decision-making process.

This area of agreement translates as a need for **integrated** land management — management that integrates potential uses and values with resource knowledge and social needs. Differing interest groups may not call for it directly or by name, yet indirectly and collectively they reinforce land management which reflects their awareness of ecological principles and ensures

consideration for their interests by accepting consideration for all uses and values.

College Research

The scope and thrust of natural resource research can be no less than what such management requires. We have a good example in the forestry college.

This summer field work will begin on a five-year $200,000 research project, cooperative with the U.S. Forest Service, called Intensive Timber Culture. This research will focus on western red cedar, western hemlock and grand fir habitat types in northern Idaho and adjacent states.

These three species are the most productive of Rocky Mountain forests and have been the mainstay of the timber industry in North Idaho. In addition, these habitat types contain a wealth of wildlife, abundant streams and rivers and a richness of scenic and recreational opportunities. Management of these forests for all their resources is of vital importance to Idaho and the nation.

The aim of this cooperative research project, then, is to develop the knowledge needed for management of these forests for increased timber production while maintaining or enhancing the wildlife, recreation and watershed values. The project involves over a dozen professionals from several disciplines in the forestry college at the University of Idaho, plus at least a dozen more Forest Service researchers.

The project includes seven substudies. The primary substudy will develop basic resource information on habitat types on Northern Region national forests, and establish timber production potentials for these habitat types.

The second substudy will examine the effects of silvicultural systems on successful regeneration, and the third will study the effects of these regeneration systems on both game and non-game wildlife species. This substudy is essential for defining the interrelationships between the timber and wildlife resources and for identifying trade-offs in alternate management plans.

The next three substudies will monitor the effects of several silvicultural practices (such as thinning, partial cutting and fertilization) on the incidence of insects and disease and on the growth and yield of forest stands. Another substudy will provide information on the effects of silvicultural practices and logging activities on water quality, and develop computer modeling methods which can be used by the Forest Service to assess potential impacts on water quality in future management.

Research Characteristics

I think this research project illustrates many of the characteristics essential to what I'm calling "integrated research."

The project in **interdisciplinary,** because a **holistic approach** — research and management which deals with the whole environment — demands expertise in many disciplines. The project is **ecology oriented,** because a resource manager must understand the interrelationship of resources before he can weigh the potential impacts of change.

The research is **predictive** and presents information relevant to several **management alternatives.** The research is **management applicable,** providing not only information which is useful, but methods which are useable by managers. An example is the water quality models which could be applied in future management in the Northern Region.

Although this type of research requires a great deal of coordination, and thus administration, and more synthesis of research data for the final report, I am convinced that "integrated research" can provide the scientific justification for integrated management.

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PHOTO CREDITS

The cover photo was taken by Jerry Allen, professor of forest resource management in the college.

Jerry caught this scene of Payette Lake at McCall, Idaho during the course in forest measurements during forestry summer camp, 1974.

Richard Walker contributed most of the scenery pictures in the magazine.

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