

# WILDLIFE CURRICULA



# WILDLIFE MANAGEMENT

by

DAVID HOLT

The Wildlife Management sequence in the School of Forest Resources prepares the student for a career in Game Management as well as Wildlife Habitat Management. Emphasis is placed on Biology and Ecology related subjects, but Humanities as well as Land Management have their place in the sequence. A large amount of elective hours left open allow the individual to diversify his education in any direction he chooses.

The Freshman year is the time when dreams are shattered or dedications are renewed. Those who think that Wildlife Management is just a happy romp through the woods are rudely awakened and promptly transfer to other majors. The survivors start all the basic courses for Wildlife such as Chemistry, Zoology, Botany, Engineering Drawing, and Mathematics.

The Sophomore year still stresses the basics such as Economics and Physics, but some of the loose ends are tied together in Wildlife Ecology and Biological Characteristics of Game Birds and Mammals. Those who didn't see the writing on the wall their first year usually get out of Wildlife after the second year. The rapid-fire attack of Vertebrate Biology and Physics tends to weed out the men from the boys and yet leave some of us for the Senior year.

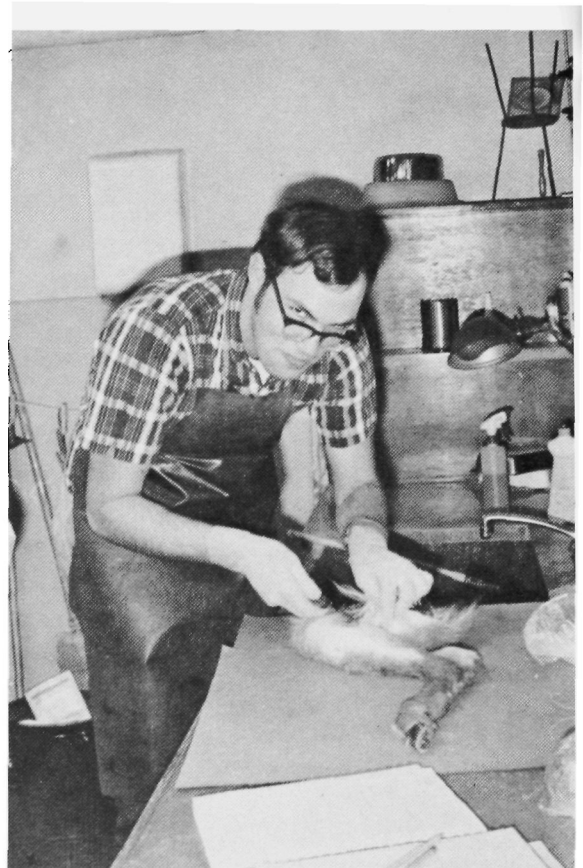
The Junior year introduces the Wildlifer to Invertebrate Zoology, Surveying, and Silvics, otherwise known as "Southern Fried Forestry!" The attrition rate is lower now, there just aren't enough people left to drop out, and transfers are filling the gaps in the ranks. The Junior Wildlifer will be able to travel back and forth between the Zo building and the Forestry Building blindfolded, but by now the number of electives has increased and the student can choose his own courses.

Summer Camp comes between the Junior and Senior years. The first week involves a field trip which rates excellent for practical observation of Wildlife areas outside the state of Maine, the first trip of its kind in the School. Following this tour are two weeks of intensive field exercises at Princeton, Maine and surrounding areas covering Biology, Population studies, Law Enforcement, and Marine Biology. After these valuable three weeks the Wildlifers join the Foresters in swimming through Indian Township (But honest, Wes, it's only just over my knees!).

Finally, the Senior year rolls around, and the finishing touches are put on the Wildlifer's training. Game Biology, Fish Management, and Wildlife Diseases draw together four years of hard work.

During these four years, a number of summer jobs are available through the Wildlife Department where the student can put into practical use the skills that he learned in school. The most important part of these jobs is dealing with people, a task far more difficult than technical problems. The same jobs can also be an asset in obtaining permanent employment with the same firms later on in life.

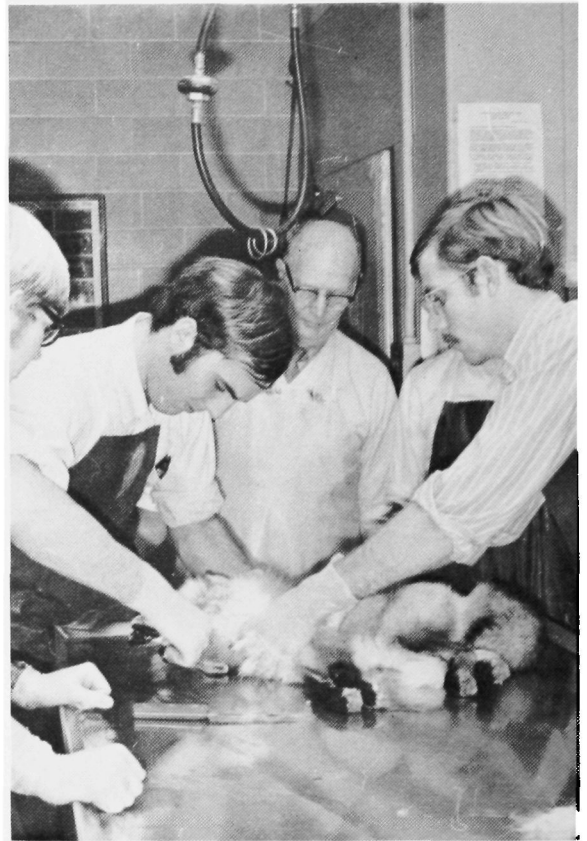
It is at graduation that the Wildlife Student finds that he has followed a very flexible course of study. Besides going on to graduate school, he can career in Wildlife Management with State, Federal, or private organizations, or work in Forestry, Conservation, and other related fields. If the student is so inclined, he can even teach Biology at the secondary school level. This versatility gives the student a wide career choice in the Wildlife Management curriculum.



# Wildlife Science

by

AUDREY MAGOUN



Students with wildlife research as their professional goal are offered the Wildlife Science sequence in the School of Forest Resources. High academic standards must be maintained in such courses as calculus, physics, and chemistry as well as in the biological sciences—wildlife ecology, invertebrate zoology, plant taxonomy, silvics, and game biology. Emphasis is placed on public speaking and professional writing as means of communication with the public. A wide range of electives may be selected in such areas as biochemistry, forestry, zoology, psychology, and mathematics.

Students are encouraged to join and take an active part in the Maine Student Chapter of The Wildlife Society—the professional society of wild-

life biologists. It is essential for the student to take advantage of opportunities that will expand his awareness of current wildlife research and modern techniques. Summer job experience and independent research are encouraged. Some of the special problems that students have undertaken this year include a food habit study of owls, development of a nature trail, a study of the relationship of heart rate and metabolism in waterfowl, and an investigation of a wild turkey restocking program.

By fulfilling the requirements of the Wildlife Science sequence and augmenting his course with as much field and research experience as possible, the wildlife student has set the necessary background for graduate work and for a career as a wildlife research biologist.



# COOPERATIVE WILDLIFE PROGRAMS





# DEER MANAGEMENT IN MAINE

by

FREDERICK F. GILBERT  
Assistant Professor, Wildlife Resources

It is an interesting, albeit discouraging, fact of life that the biologists, who take the brunt of invective with respect to deer management, are not in a position to actually manage deer. This has been the responsibility of a group of politicians who meet once every two years in Augusta. Certainly biologists can make recommendations but what sincere, dedicated biologist is going to propose regulatory changes such as season length, dates of opening, bag limits etc. when the only information he has going into the end of January of a legislative year is the harvest total for the previous fall. For the second year of the biennium his crystal ball doesn't even have that glimmer.

Come July of any year when the previous fall's harvest figures have been completely analyzed on a regional basis, the biological data gathered at hunter check stations has been similarly handled and the results of hunter questionnaires tabulated; when the effects of the overwintering period are known with respect to actual losses and fawn production; when all these data have been put together and compared between biological zones; then and only then are the managers in a position to make recommendations for management procedures to be followed in the approaching open deer season. But by this time the legislature has "closed up shop" for *two* years. The deadline for presentation of bills passed some months back and the legislature has in fact decided what the deer seasons will be like for the next two hunting periods.

Is this a realistic way to manage Maine's deer population? Should not some very serious thinking be given to relegating some of these very important decisions with respect to an important natural resource to a body more responsive to the actual needs? To a body that was in position to react in that critical July-August period before the fall hunting season? While many legislators and members of the hunting public may be reluctant to invest such authority in the Commissioner of Inland Fish and Game why would not the Fish and Game Advisory Council, a duly authorized committee of the Legislature, be in a position to serve this function.



Never forget that much valuable information is currently being gathered on Maine's deer resource by this State's game biologists and wardens. Much of this information can not now be utilized in management decisions because of legislative considerations. Would it not be to the advantage of Maine's deer herd, deer hunters and citizens in general if this information could be used in more effective management of this resource?

To this end a bill was presented to the 105th Legislature by Senator Eldon Shute, of Farmington, which would divide Maine into 8 deer management units. The seasons within these units could be modified (i.e. closed or shortened) by the Commissioner of Inland Fisheries and Game should the need arise. This proposal would serve the needs of both the deer resource and the deer managers in this State and we hope will have been passed by the time this article comes to press in the Forester.

# WARDEN SCHOOL

by MALCOLM W. COULTER

Associate Director, School of Forest Resources

Reginald Tait, District Game Warden, sighed with relief as he completed a report concerning the rescue of a lost hunter. He hurried to change his uniform before taking the kids to the Friday night skating party. Since completing Warden School last year he had many long days and today was no exception. The day had begun when he and the warden from the adjacent district appeared in court to bring charges against a trio of night hunters. Later he had flown with one of the warden pilots and a game biologist on the coastal waterfowl inventory. Home early because of snow squalls over Frenchman's Bay, he had answered two phone calls about snowmobile registration and one complaint of dogs harassing deer while completing the lost hunter report.

Susan reminded him that the party began in twenty minutes. The phone rang. It was Pete Sawyer, Assistant Scoutmaster, who asked Reginald to speak on hunter safety to Troop 19 a week from Monday evening. Pete had just returned from his first ice fishing trip of the season and was eager to tell the details of each catch. The minutes ticked by. Susan and her sister stood nearby, skates in hand—the party was to begin in just five minutes.

Reginald left the girls at the skating pond. He started over to visit with Joe Brooks who had

been cruising timber near Beddington. Joe had left word that he had located a sick moose and chances were they might want to go up and obtain samples for the laboratory at the U. of M. Then the call came over his two-way radio—a snowmobile accident on Parson's Hill south of the Bagaduce Road. Reginald turned around while radioing his position. He sped away from the village lights and off into the blackness of the winter night, wondering whether he would be faced with an unconscious passenger, intoxicated driver or any of a score of other situations.

Possibly it was these kinds of days (and nights) that prompted the Fish and Game Department to explore, with the School of Forest Resources, the opportunities for a more intensive training school for game wardens. The Warden Service has a long history of in-service training. But, with the increasing and varied responsibilities being assigned to the wardens, the need for additional training had become critical.

Planning for the first School of this kind in New England began in 1964. It soon became apparent that several instructors would be needed to teach the range of subjects considered necessary. When the first 10-week school opened during mid-winter in 1965 with a class of 16 wardens, there were more instructors than students! That has



been the pattern for each annual session since. The Fish and Game Department and the University have pooled their resources to obtain the best teachers possible for each subject. The 1971 school, for example, has 33 instructors. Eight are faculty members in five departments at UMO; one comes from UMA; one from Thomas College in Waterville; 3 from various divisions of the Fish and Game Department plus 17 from the Warden Division and 4 from other organizations.

The instruction includes lectures, laboratory and field demonstrations and special trips to the State Police Laboratory, the Health and Welfare Laboratory, where animals are tested for rabies, legislative hearings, fish hatcheries, court sessions and winter deer concentration areas. The topics covered may be grouped as follows:

**Law Enforcement**

Fish and Game Laws

Boating and Snowmobile Laws

Techniques for patrol, search and seizure, arrest

Interrogation

Ballistics and Preservation of Evidence

**Field Biology**

Tree and Shrub

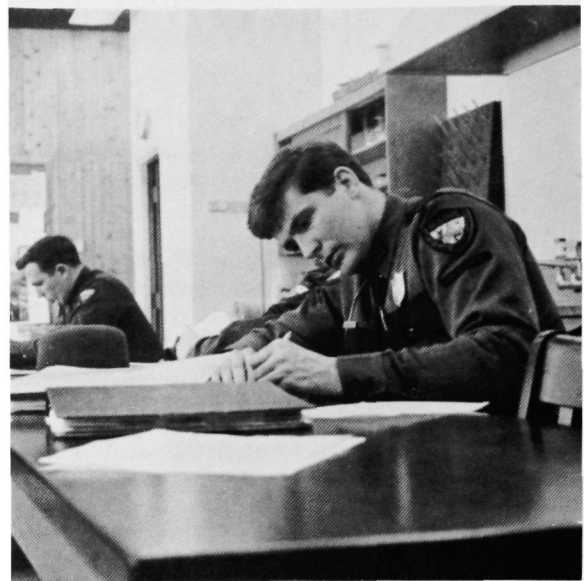
(includes identification and

Identification

Game Biology

introductory ecology)

Fisheries Biology



**Communications Skills**

Public Speaking

Courtroom Procedure

Report Writing

Conversational French (needed especially along the northern border)

Public Relations

**Miscellaneous Techniques**

Map and Compass

Self Defense

Safety—Gun, Boat, Snowmobile

Outboard Motor and Snowmobile Maintenance

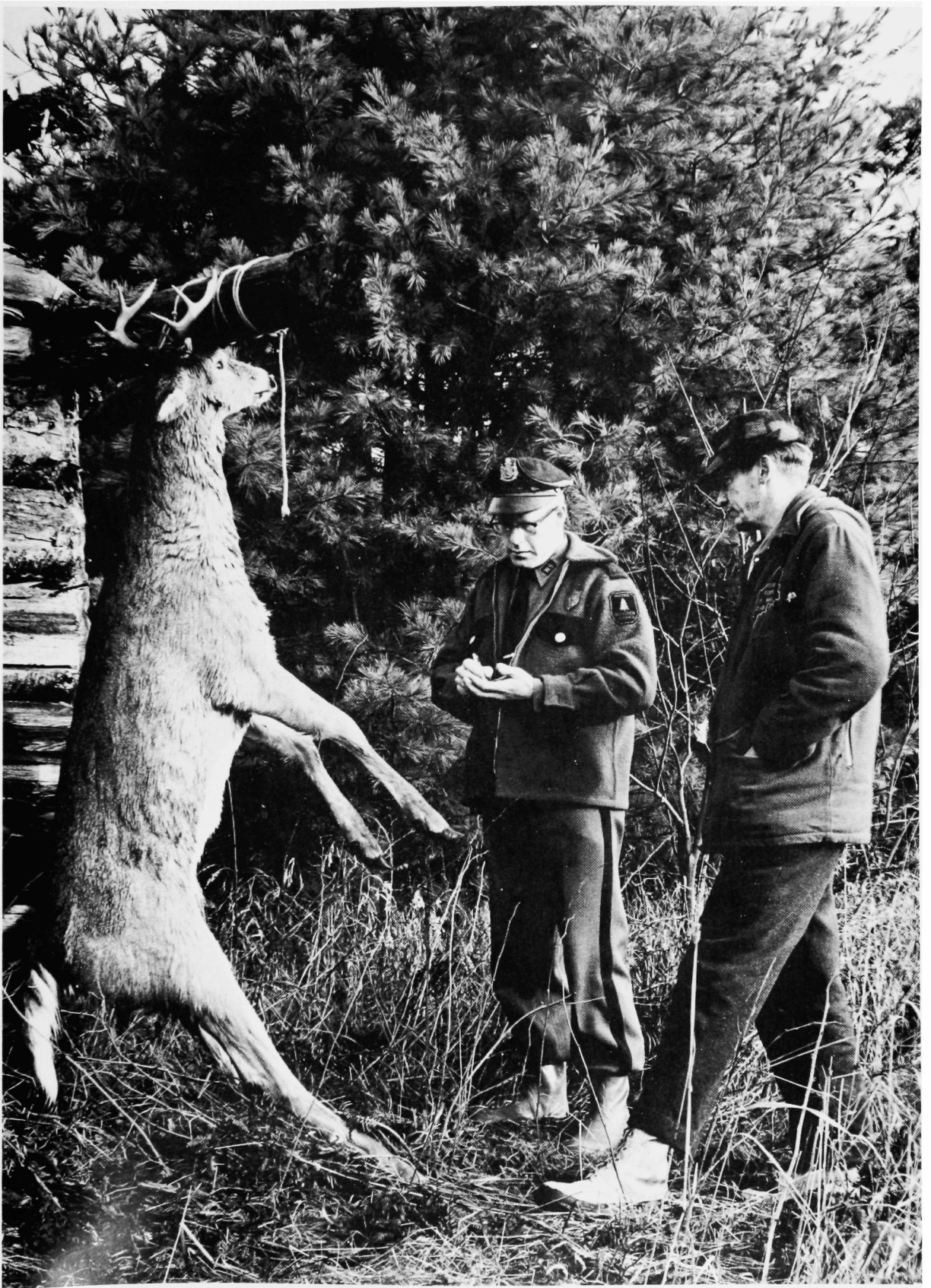
Use of Dynamite (often needed to remove beaver dams)

The annual school has included 12-15 state game wardens. The Vermont Fish and Game Department sent two wardens during each of the first five years. Recent classes have included a ranger from Baxter State Park.

To return to Parson's Hill, Reggie found a dozen people milling around an over-turned and damaged snowmobile. Two boys had been riding the machine when they collided with a stone wall. Fortunately neither was seriously injured, but the accident required another report. As he drove down toward the village to pick up his girls at the skating party he could not help but recall that during this day his duties had required some skill several of the topics covered during last year's warden school.







# FORESTRY



# CURRICULA

# FOREST MANAGEMENT

by  
ELBRIDGE CLEAVES

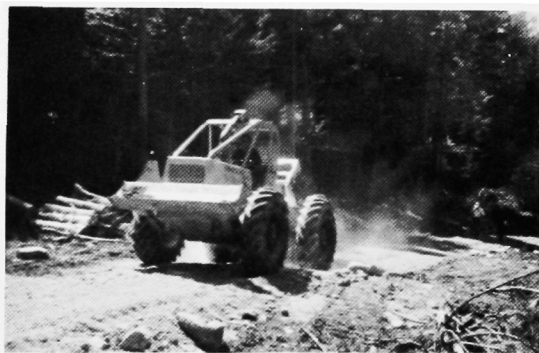


In today's society forest resource managers must be highly trained in all aspects of the Forestry Profession as well as educated to the economic and social attitudes of a dynamic public. The Forest Management sequence offered at the University of Maine provides this type of training and education necessary for the future land managers of the world's forest lands.

The Forest Management Curricula has the same core courses as the other forestry and wildlife programs. Among these 64 degree hours are courses in science, mathematics, and communication fields. Also, in order to provide a basis for further forestry studies, courses such as dendrology, forest mensuration, surveying, and forestry drawing are required. These core courses are designed in such a way that they are usually confined to the freshman and sophomore years of undergraduate work.

During the junior and senior years, specialized courses which include silvics, silviculture, photogrammetry, harvesting, fire control, forest economics, forest policy and administration, and forest management are given. A thorough understanding and a knowledge of the practical application of these professional studies are of the utmost importance for the forestry graduate.

Throughout the four-year program, a number of non-required courses are needed in order to complete the 132 hours of class work. The choice of electives is usually left up to the student; however, a range of business, social, or wildlife management studies that can aid the forester in his profession is suggested. These electives are chosen



by the students with care so that a good, broad-based education is obtained.

Forestry summer camp comes between the junior and senior years. Six weeks of field experience gives the students a sample of the actual practice of forestry in its natural elements. The experience gained from summer camp and from summer jobs within the forestry field provide a substantial practical background for the Maine Forester.

Maine Forestry graduates have been a highly sought-after group of professionals by all employers in the field of forestry because of the fine training they receive from a well-qualified and experienced faculty. Within a nation that is one-third forest land, and with a forest industry which contribute \$25 billion per year to the gross national product, the need for highly trained professional foresters now and for the future is evident.



# Forest Utilization Curriculum

by

BRUCE D. TURMENNE

Of the five specific forestry sequences offered by the School of Forest Resources, only Forest Utilization has the unique ability of emphasizing the entire forestry spectrum, from tree growth to finished forest product. A B.S. degree earned in this sequence qualifies for membership in the Society of American Foresters and other professional societies.

The curriculum is designed for the student who wishes not only to understand tree growth as a physical-biological complex, but also to enable him to supply this knowledge to the problems encountered in manufacturing and marketing of forest products. It emphasizes forest growth, forest and industrial management, forest business, harvesting, forest products and manufacture, timber mechanics, and technology. Beyond the 64 required core hours, Forest Utilization requires 68 hours of specific courses, 12 hours of suggested electives, and at least two courses in each of literature or fine art and history or government. The 12 hours of suggested electives must be taken in any of the fields of business and economics, engineering, forestry, soils and geology, mathematics, and pulp and paper. The student is encouraged to take electives which will be of greatest value to his career, such as computer programming, calculus, engineering, and process analysis. Thus a student is able to supplement his professional curriculum and satisfy his individual interests and abilities.

The sequence's name, Forest Utilization, implies that it leans heavily upon two other respected sequences, Forest Management and Wood Technology. From the Forest Management sequence the student learns about tree growth and forest influences. Required courses dealing directly with this include silvics, silviculture, timber management and valuation, forest economics, forest policy and administration, fire control, harvesting, geology, and entomology. From the Wood Technology sequence the student learns about the mechanical and physical properties and their proper application to finished wood products. Courses dealing directly to this are plant anatomy, wood technology I & II, wood identification, forest products, and lumber manufacture. Other required courses of special interest include advanced professional writing, accounting, and at least one additional economics or business elective. Forestry summer camp and a utilization trip are required. Both give valuable experience in subjecting the student to different forestry policies and practices.

Today's technological society has imposed many ecological and economic pressures on our valuable forest resources. As professionals, we must not only draw from the forest the basic fiber for our proper existence, but we must also improve this resource for future generations. I believe Forest Utilization achieves this objective in two ways. First, the student learns proper silvicultural and management practices, insuring immediate economic gain and improved future yields. Second, the study of wood technology teaches the future forester how to better utilize the raw fiber which is harvested.

Unlimited career possibilities exist for the student in the Forest Utilization sequence. Persons securing this degree will find opportunities wherever a professional forester is needed, both in private industry and in public agencies. The types of positions available include civil service positions, forestry, industrial management, product development, production engineering, process design, retail sales and marketing, pulp and paper, public relations, and many more. The student pursuing this course of study should find a very rewarding and satisfying career.



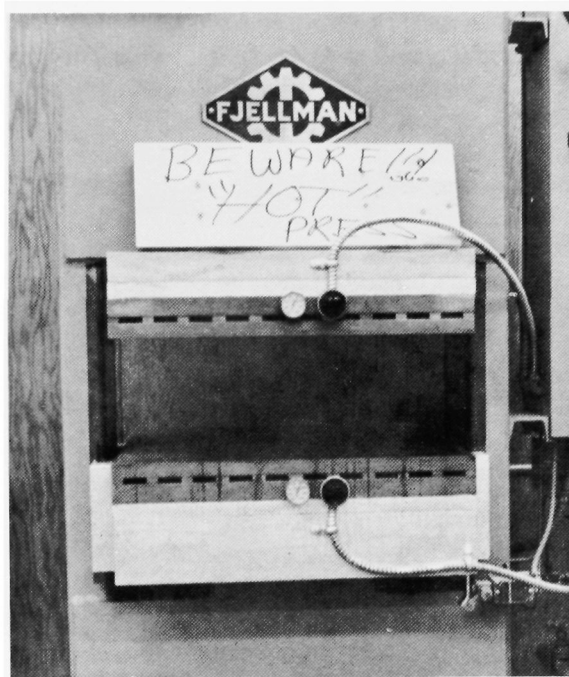
# The Wood Technology Sequence

by

JOSEPH M. SCHWARZMANN

The Wood Technology sequence offers programs in the fields of wood science, wood products engineering, wood manufacture, sales, and both fundamental and applied research. A student can study anything ranging from sawmill operation to the ultrastructure of wood.

Since a wood technologist will probably spend little time on field work, the students are allowed to get out into the industry instead of going to summer camp, between their junior and senior years. The job that the student obtains must be faculty approved, and an indepth report of the company or some phase of its operation, in which the student is interested, must be written and approved. Two credits are given for this optional program, so that six other credits must be added into the student's already difficult schedule. A student, through the proper selection of courses, can prepare himself for a wide variety of jobs, including research, sales, and industrial management, for which there is great demand.



# The General Forestry Sequence

by

BLOX DAUGHERTY

The General Forestry sequence is unique in that it allows the student to design his own curriculum to some extent; to meet his own needs and career objectives. Outside of the 92 hours of required courses in the basic sciences, social sciences, communications, and forestry, the student must complete 15 hours of forestry electives, 6 hours in botany, geology, or soils, and an additional 28 credit hours of free electives in order to have the necessary 141 credit hours for graduation. Because these free electives can be from a variety of subjects or a specialized interest, they can beneficially supplement the study of forestry by providing a background in anything from business administration to sociology to wildlife to zoology.

As the field of forestry becomes more complicated there exists a need for foresters with backgrounds in related subjects such as those mentioned above. We can no longer exist just to grow wood. And if we are to integrate with the recreationists, the economists, the businesses that support us and the wildlifers, we must afford the op-



portunity in our education for foresters to become adept at these subjects. This is the strong point of the general forestry sequence—that the forester usually has studied subjects not under the forestry title but which are applicable to the problems which we foresters face.

Another advantage is that it allows a student to specialize in an area where there is no sequence. An example would be Forest Economics, a combined Forestry-Wildlife sequence, or Forest Engineering; sequences which are offered at some institutions in some degree.

The General sequence is often overlooked by students as being the easiest way to earn a degree in the department, or as a nonstructured, insecure program inferior to the others. However, I believe quite the contrary; a serious student interested in the electives he chooses when designing his program of study can regulate the course of the sequence. And the flexibility of the sequence can be a very desirable characteristic for selecting it as one's course of study.





# THE FIFTH YEAR PULP AND PAPER PROGRAM

by

GEORGE T. HODGSON



One of the more unique programs at the University of Maine is the fifth year pulp and paper program. Students with average or better grade points are eligible for the pulp and paper curriculum. Although engineers and foresters are preferred, business, math, chemistry, and other majors make acceptable candidates. Some of the most attractive features of the fifth year program are: 1) generous financial assistance, 2) great opportunity for course electives, and 3) more opportunity for independent study. To elaborate on the financial aspect of the program, the University of Maine Pulp and Paper Foundation, made up of many individual companies of the Paper Industry, has established a well organized scholarship fund. Fifth year students receive enough scholarship money to cover their tuition, room and board, and book costs for a full year. In the past semester, Fall of 1970, over \$90,000 was awarded to University students. If a student should decide to enroll in the fifth year program before completing his degree work, he may receive additional scholarship money to finance his undergraduate years.

Financial aid is important, but the fifth year has even more to offer. A total of fifteen credit hours are required for the pulp and paper certificate. This leaves much room for course electives.

The only restriction is that an elective program should have some degree of uniformity. People interested in management might take business electives, while research minded people would be interested in more technical electives. The main point is that students still have a good deal of freedom in choosing non-required courses. One of the more striking features of the pulp and paper curriculum has to do with two required laboratory courses, one on pulp technology, the other on paper technology. Lab groups made up of usually three students have access to a wealth of small scale industrial equipment. Trained technicians along with real world, industry minded professors are available to assist the students. However, the significant point is that students are free to design their own experiments, experiments which often relate to current industrial problems. For all practical purposes, the students are completely on their own, free to make their own hours and free to make whatever effort they deem worthwhile.

The pulp and paper program at Maine is highly respected outside the walls of the University. It not only provides a broader perspective for our foresters but also serves as a valuable asset when the nitty-gritty problem of employment calls upon the insecure graduating student.

# THE NATURAL RESOURCES CURRICULUM

by

TED HOWARD

With a wave of the magic wand, and encouragement from the National Science Foundation, the Board of Trustees of the University of Maine in cooperation with the College of Life Sciences and Agriculture created a new degree program entitled Natural Resources Management, with four areas of concentrated study: soil and water conservation, conservation engineering, economics, and forest resources. The forest resources option of this program is the topic of this article.

Like the general forestry curriculum, natural resources-forest resources makes it possible for the student to touch all bases instead of being sluiced into one branch of forestry like a piece of pulpwood into a river, to become the end product of specialization in the other sequences: forest management, forest utilization, wildlife management, etc. As in general forestry, this new approach enables interested students to enter such fields as information, education, and even management, but with a greater eye towards the public's needs and rights in addition to timber production and wildlife management. This program gives a broader view to the resource picture and to the relationship between forestry and other natural sciences. Among the required courses which tend to widen the student's outlook are oceanography, fisheries management, agricultural resource economics, contemporary environmental pollution, and a variety of "people" courses such as political science, philosophy, and sociology. By and large, these courses are available to the forestry major only as electives. At the same time, the natural resource major also studies most of the professional forestry subjects.

Of course, every program has its disadvantages, and the natural resources curriculum is no exception. One significant problem is that the program is not recognized at this time as a professional degree by the Society of American Foresters. However, with the present emphasis on the overall environment, the S.A.F. and those companies who require a professional degree as a prerequisite to employment may have to change their position on

the professionalism of the natural resources curriculum.

Natural resources requires that you complete 120 credit hours for your degree. At first, it would appear that your education would be lacking 21 critical hours from the regular forestry program, but closer examination of the program's requirements reveal that the "missing" 21 hours are composed of a couple of good courses that may be taken as electives above and beyond the necessary 120 hours, and several elementary courses taken by the forestry major as requirements for the professional degree. This creates several open hours which may be filled with courses which would be more relevant to the student's plans. For example, if you had inclinations toward the teaching profession, specializing in the environmental sciences, these open hours could be used for the foundation courses in the College of Education which are required for certification. Or perhaps you could pack in journalism courses, chemistry, engineering, or anything else that you felt was important. Those students with journalism "minors" would be prepared to work in the information and education divisions of state natural resource departments. The current environment push by the public and the government will extend into the public schools as well as into the colleges and certified teachers with a degree in the environmental sciences will be needed in hundreds of school systems across the nation to instruct the youth of America in basic environmental concepts.

Perhaps another plus for this approach is that summer camp is an elective rather than a requirement. If you felt that you needed the experience of Princeton you could go or you could find employment somewhere learning more about your future career.

If you are one of those students who become disillusioned with the professional forestry program but still wish to remain in the forestry discipline, take a good hard look at the natural resources curriculum.

# FEATURE ARTICLES

TREE IMPROVEMENT IN MAINE  
THE OLDEST AND THE NEWEST STUDENT  
THE ROLE OF THE FORESTER IN MAINE'S  
FUTURE  
ENVIRONMENTAL QUALITY IN AMERICA'S  
FORESTS



## Introduction

For over 20 years the South has been experimenting and developing superior trees for planting. Because of this, the South has become an area of great research in the field of forest genetics.

Dr. Robert L. McElwee has an extensive background in forest genetics and consequently we are fortunate that he decided to come to Maine to promote a forest genetics program.

Dr. McElwee was born in West Virginia and received his B.S. in Forestry at West Virginia University in 1951. His M.S. and Ph.D. degrees were obtained at North Carolina State University in the field of forest genetics in the years 1960 and 1970 respectively. Before going to North Carolina State he worked on Crown Zellerbach lands in Louisiana. While at North Carolina State, Dr. McElwee spent 14 years on a tree improvement program in cooperation with industry.

The University of Maine was in great need of a forest geneticist. The search ended with the hiring of Dr. McElwee in the summer of 1970.

Dr. McElwee plans to work with graduate students in forest genetics and may teach an undergraduate course on genetics in the near future.



## TREE IMPROVEMENT IN MAINE

by

R. L. McELWEE

In many regions of the United States, as well as other major forested areas of the world, tree improvement is being relied upon to increase quantity and quality of wood produced on forested lands. Tree improvement, the application of genetic principles to enhance wood production, is one of several newer silvicultural techniques being applied to managed forests to offset impending wood shortages. Other techniques now accepted in many major wood-producing areas include site preparation and forest fertilization. To be effective, tree improvement must adapt to all cultural practices incorporated in management and be compatible with the biological capabilities of the species.

Major gains in production are being made by adherence to sound biological principles through tree improvement. Although the degree of improvement will vary trait by trait, overall gain in yields now being achieved vary between 5 and 15 percent in the first generation. Additional gains will be made in later generations. This gain is made through improvement in such characteristics as disease and insect resistance, wood quality, form, and gross volume production. Improvement programs are underway in many species of softwoods and both temperate and tropical hardwoods. The most active programs with species closely related to those of Maine are in the Lake States and Scandinavia.

Why is tree improvement not being actively incorporated into forest management in Maine? After all, the forests of the state are a prime source of gross income and similar possibilities for increased yields are inherent here as elsewhere. The answer to this query is complex and hinges upon the conditions leading to increased levels of management and wood production.

The fact that wood shortages have not materialized in Maine is a primary reason for the lack of more intense management techniques, including tree improvement. Worldwide, and in some regions of this country, wood shortages are imminent or have already materialized. Land use policies and alternate demands for land are removing millions of acres from forest production annually. We are faced with an increasing demand for forest products which must be produced from a shrinking land base. Such a situation forces intensified forest management practices. Tree improvement is one technique of advanced silviculture and management being relied upon to achieve increased production. Until timber shortages are threatened or realized in Maine, little impetus will be found for increasing the level of management.

Effective improvement of yield and quality of forest production can economically be achieved only with systems of artificial regeneration. Little effective genetic gain can be made with natural regeneration. Those regions of the world successfully incorporating tree improvement into their forestry programs rely nearly 100 percent on artificial regeneration. Artificial regeneration is not practiced in the Northeast to the degree necessary to justify tree improvement. Current timber drain is far below timber growth. So long as this imbalance is maintained, advanced management systems will be slow in evolving. The big question, however, comes in predicting future demands. What will be the growth-drain situation 10 to 30 or 40 years hence? If industrial expansion, taxation, or alternate land use tip the scale to the place where drain exceeds growth, more intensive management systems must be used or the region will deplete its forest resource. It is within this area of long-range prediction that future management intensity will be decided. Accomplishments else-

where would indicate that indigenous species and sites are capable of reacting positively to intensification of management. Economic motivation, however, has not yet justified changes. Before any basic changes are made, research and pilot-scale studies must prove their feasibility. It would be foolhardy to initiate such drastic changes without solid technical information to back them up. If the need for change is within the realm of probability, the need to develop answers to problems and methods of intensification is critical. A second prerequisite, therefore, for tree improvement to become operational in Maine is a demonstration that future requirements will justify intensification of management and that the species and sites will react in sufficient magnitude to be economically feasible.

A third important factor having bearing to possible change will be public reaction. The socioeconomic philosophy of the area, and resultant resistance to changing policies, would require astute public information programs to forestall adverse legislation. Clearcutting and artificial regeneration policies have met resistance in some regions, requiring detailed demonstration that multiple use is enhanced, not endangered, by such practices. Both to the north and south of us such methods have been accepted once economic and social value are proved. There is little to indicate the same acceptance cannot be obtained here.

In summary, for tree improvement to become operationally feasible in Maine there must be a demonstrated need for increasing the productivity of the forest lands and an economic need for reducing rotation lengths, necessitating a change from conventional natural regeneration methods to planting. Meeting such needs, should they develop, requires drastic alteration of present forest land management policy. If there is the chance that such changes will become desirable and necessary, methodology must be developed from research and pilot plant studies yet to be initiated. Such high-order management is being practiced with species and on sites similar to those of Maine, but only concrete information for local species and sites will allow realistic decisions to be made with confidence for this area.

## GUEST ARTICLE

# Introduction

Dr. Duncan Howlett has always been a very ambitious man. This would explain why, as a retirement project, he undertook to manage some forest land. He is also a thorough man and this explains why, at 65, he went back to school to study forestry.

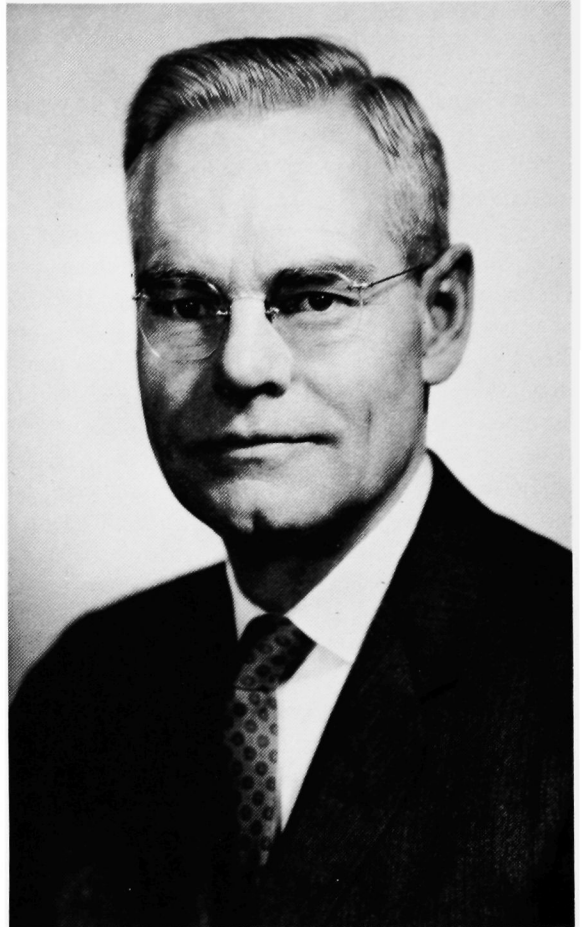
Dr. Howlett received a Bachelor of Science degree in 1928, a Bachelor of Laws degree in 1931, and in 1936 a Bachelor of Sacred Theology degree all from Harvard. In 1957 he received a Doctor of Laws degree from Emerson and in 1958 a Doctor of Divinity degree from Meadville.

After being admitted to the Massachusetts Bar in 1931, Dr. Howlett engaged in the general practice of law for two years. He was then ordained as a minister on November 17, 1935 in the Unitarian Church. His last pastorate was the All Souls Church in Washington, D. C. from 1958 to 1968.

While in Washington, he served on the District of Columbia Commissioners Youth Council from 1959 to 1964 and on the District of Columbia Commissioners Crime Council in 1963. In addition, he was chairman of the District of Columbia Advisory Committee to the U. S. Commission on Civil Rights. The above are but a few of the positions he has held in the Unitarian Church and public service.

In addition, Dr. Howlett has found time to author four books. They are: *Man Against the Church*, *The Struggle between Religion and Ecclesiasticism*; *The Essences and Christianity*, *An Interpretation of the Dead Sea Scrolls*; *The Fourth American Faith*; and *No Greater Love*, the James Reeb Story.

We are privileged in having Dr. Howlett share his thoughts and impressions of his experiences here at the School of Forest Resources with us in this article.



# THE OLDEST AND THE NEWEST STUDENT

by

REV. DUNCAN HOWLETT

"How do you like it?" everybody asked on learning that at age 65 I had gone back to school.

"How are you getting along?" those who know me better would inquire, some of them a little too anxiously I thought. But their concern was legitimate. Going back to school after a thirty-five year lapse was quite an experience.

"Why did you do it?" was not a question anybody asked me, but I put it to myself one day last October as I staggered out of Dr. Griffin's first "quiz", a five page single spaced set of questions mimeographed on legal size paper. "Why put yourself through all that again?" I found myself thinking.

The answer, of course, lay in the question: because I have been fortunate enough to enjoy considerable schooling and know its value. When I turned to the cultivation of trees as a retirement project it soon became apparent to me that all the reading and meeting-going I might do would not be enough to enable me to gain anything like the understanding of forestry I wanted and needed. An expert forester, Norman Gray of Fryeburg, had been advising me since 1964. We had attended many meetings together. I read books furiously and talked to whomever would listen. But it was not enough. The things they said only whetted my appetite to understand more of the basics of forestry and to gain some kind of over-view of the field as a whole.

Slowly during that period, the winter of 1970, the idea of doing formal work at the School of Forest Resources at the University of Maine began to take shape. I had long known the school by reputation and had met Director Nutting at various forestry meetings in Maine during the summer. In March of 1970 I attended as a guest, the meetings of the Northeast Section of the Society of American Foresters. While there I attended the School of Forest Resources Alumni Breakfast and by chance was seated at a table with Mr.

Edwin Giddings. On broaching to him the idea, which seemed quite insane at the time, of going back to school in September he was enthusiastic and warmly encouraged me to give it a try. Director Nutting did the same when I talked with him about it later. So did Norman Gray.

As a result, September 14 found me registering as a Special Student at the School of Forest Resources taking regular courses for credit, and feeling very strange. Wearing a jacket and tie, my head capped with gray hair, I was addressed by one and all as "sir" and treated with the difference due only to upper level faculty and administration officers. So the next day I took off my coat and tie, put on an old pair of pants and a well worn plaid shirt and tried to look like a student. I professed and doctored and sirred the faculty and said "hi" to the students. I hung around with them and ate with them and kept out of the faculty dining rooms. To my great delight, slowly the students began to accept me as one of them.

The real change-over came about through the lab exercises in Silvics, a series of assignments that are famous throughout the University, justly so. It was the acid test. With the rest of the students, I went out in warm weather and cold, in sun and rain and with my lab partner, Jim Hall, tramped up and down and around and over our plot, measuring, it seemed almost every tree on it. Like the other students, soon I began putting in all extra hours these lab exercises require and like them redid the exercises that did not come out right. As the fall went on we became fellow workers in a common cause, fellow subjects of a common discipline, and through the fellow-feeling this engendered, friends.

Unfortunately for me it all came to an end too soon. As I write this I am back in the church again and back in the city, far from the fresh clean beauty and quiet of the forests of Maine. This of course is my work and I am glad to be where I am needed. The church has always been my first



love and remains so. But my love of the natural world, specifically for the forest is no less a part of me and from that point of view it was a great disappointment to have to give up my studies before the year's work was complete.

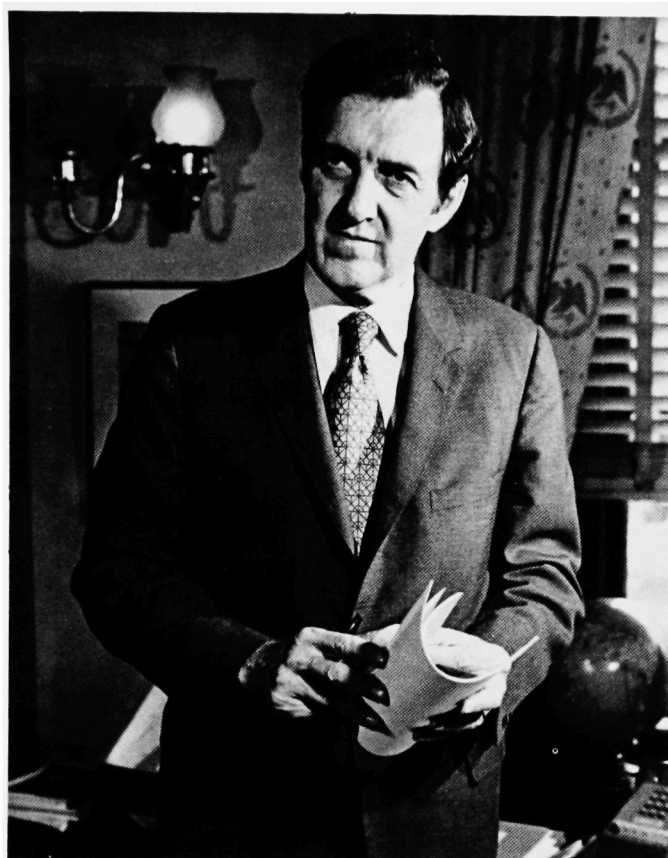
If, despite my brief association with the School, this year's class is willing to claim me in some sense as an extra-curricular member, I can only respond by saying it is a membership I am proud to own and an association I shall always treasure. As the years go on I shall be spending more time in the forest than in the city, more time in forestry than in the church and should therefore be seeing more of my fellow-workers in woodsmanship than is now possible.

To any members of my generation who may chance to see this volume, and to any who are younger and are looking toward retirement some day I can only say, based on my experience: for your retirement activity choose something different from whatever it is you have been accustomed to do. Choose something that will put you in a new

environment, introduce you to a new set of people, and force your mind into a new set of thought patterns. You will find it difficult but exhilarating, demanding but very rewarding. And if they chance to be foresters or forestry students you will be astonished and delighted at how warmly you will be received.

Through this publication I am glad to be able to express my gratitude to the School of Forest Resources, to Director Nutting, to Dr. Griffin and Mr. Giddings whose courses I took for credit, and to several of the other faculty members whose courses I audited. I am no less grateful for the friendship of the students. I shall never be a forester in the sense that they will and do not so aspire. But because of my work at the University of Maine I shall always be more at home in the woods and far more knowledgeable about how to manage my own forest than was the case before. With luck, our paths will cross again in the future, and if the faculty is willing again, maybe another year I will be back for more.

## Introduction



It seems appropriate that Senator Edmund S. Muskie should comment on "The Role of the Forester in Maine's Future". He has served in several levels of state government in Maine and now as a U.S. Senator representing Maine. In addition Senator Muskie has been active in supporting measures intended to improve the quality of our environment. With this background Senator Muskie should have a good understanding of the needs of the State of Maine.

Senator Muskie began his public service career in 1946 with his election to the Maine House of Representatives. He was State Director of the Office of Price Stabilization in 1951-1952. From 1952 to 1956 Senator Muskie was Democratic National Committeeman. In 1954 he became Governor of Maine and served in that capacity until his election as United States Senator in 1958. In 1968 Senator Muskie became the Democratic Nominee for Vice President of the United States.

Currently, Senator Muskie serves as chairman of the following subcommittees: air and water pollution, intergovernmental relations, health of the elderly, and disarmament. He is also a mem-

ber of the committees on public works, banking and currency, government operations, foreign relations, and a special committee on aging.

In addition to serving on numerous committees, Senator Muskie has sponsored the following bills: Water Quality Act of 1965, Clean Water Restoration Act of 1966, Solid Waste Disposal Act of 1967, Resource Recovery Act of 1969, Environmental Quality Improvement Act of 1969, and Resolutions in support of the International Biolog-Program and the United Nations Conference on the Human Environment in 1969. These are but a few of the bills that have been sponsored by Senator Muskie in the air and water pollution abatement and protection of human environment areas. He has also sponsored bills dealing with urban problems, intergovernmental cooperation and efficiency, and economic development.

With his many and diversified interests in the State of Maine and in environmental quality, Senator Muskie is in an excellent position to express his ideas of the role the forestry profession can play in shaping Maine's future.

# THE ROLE OF THE FORESTER IN MAINE'S FUTURE

by EDMUND S. MUSKIE

United States Senator

America has reached the point where man, his environment and his industrial technology intersect. We confront our deteriorated environment, our devouring technology and our fellowmen. Relative harmony has become a three-cornered war—a war where everyone loses.

No society has ever reached this point before; no society has ever solved this problem. We have no past experience to guide us. So we will need all the enthusiasm, all the concern and all the dedication we can muster. Forestry students have been ahead of much of the nation in demonstrating this concern.

By the very selection of forestry as a career, young men and young women show their awareness of the need for sound management of our resources and thorough research into means of protecting them.

Forestry students confront the dilemma that faces all of us concerned with Maine's development: how do we reconcile the need for jobs and natural resources with the protection of our unique environment? Do we govern our development by the economics of the situation or its ecology?

For example, economic forestry practices are not always the most ideal ones if all environmental factors are considered. Monoculture—or single species—stands are more economical to manage but multi-specied stands resist insects, disease and fire better. Which course do we follow?

Forestry students know the environmental crisis. They live with it every day. Beyond the obvious source of lumber and wood fibers, the resources they will manage as professionals provide storage of clean water, produce oxygen through photosynthesis and provide areas for recreation and wildlife refuges.

Even in Maine, society is placing more and more demands on forest lands. Man needs more water. He looks to the lakes of our forests. Man awakens to the need for more recreation areas, more land for birds and animals. He looks to our forests. He needs lumber for the increased housing our citizens demand and deserve. He looks to our forests. He needs land to build hospitals, industrial plants,

homes and schools. He looks to our forest and he starts crowding their boundaries.

These demands take forest land out of production for wood fiber and timber. At the same time, the demand for wood fiber and lumber is increasing. This squeeze demands more intensive management of what forest lands we have left. And obviously the professional forester will play a crucial role in the direction in which our state moves.

For too long we have behaved as though our supply of resources was endless. Foresters know that is not the case. They must take an active role in educating the public in terms the public understands. They must testify at public hearings. They must help write laws to protect our resources and yet provide for their economic use. They must ask whether the environmental impact of a new plant has been considered—and help study it if it has not.

Everyone must be brought into the act to protect the environment. That educational task will be enormous. We must create new values for life in a kind of world that man has never known—a world of increasingly delicate balances between man and his environment.

Some colleges and universities have developed comprehensive programs of environmental and ecological studies, but there is much more that we can and should do.

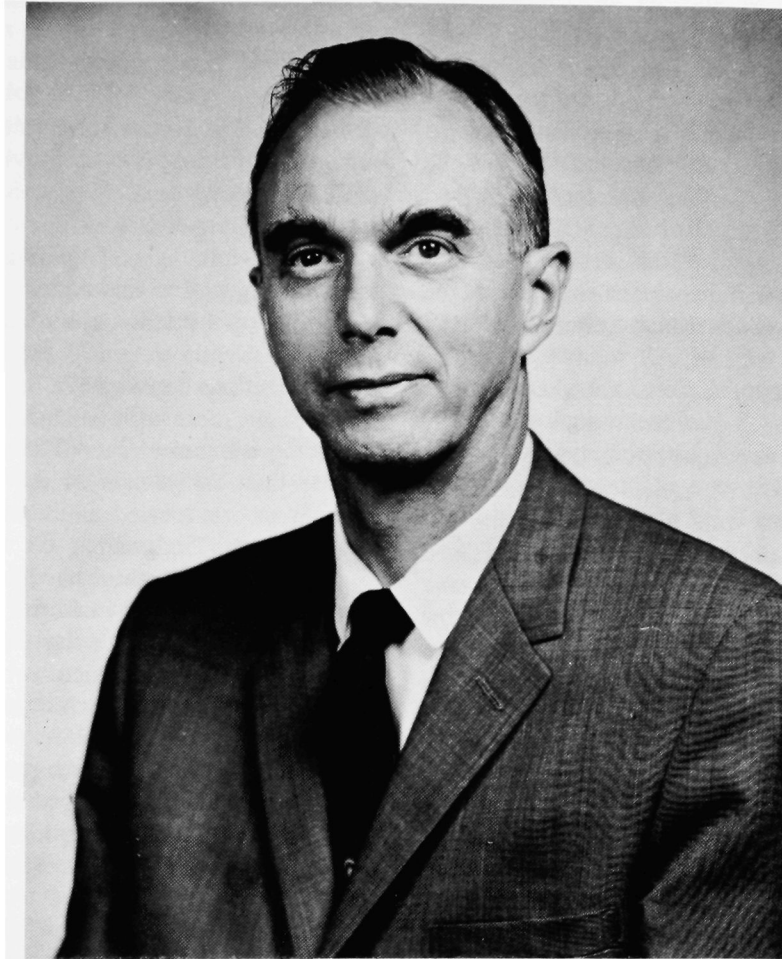
First, we should broaden the mission of our land-grant universities. We must move from a production-oriented educational system to a system designed to preserve a balanced and healthy environment. Our universities must reach out to the people of their states with programs of environmental extension services.

Second, we should develop a system of National Environmental Laboratories to explore the effects of technology and growth on the human and natural environments.

The professional forester has a responsibility as a citizen of Maine. He cannot sit in an office with graphs and charts or walk in the woods with his ideas. He must speak out. Only in that way does democracy work and man protect what he has left to protect.

## GUEST ARTICLE

# Introduction



ARTHUR W. GREELEY was born in Washington, D.C., August 1, 1912.

Mr. Greeley received his B.S. Degree in Forestry from the University of Washington in 1934, and his Master of Forestry Degree from Yale University in 1935.

He started his Forest Service career as an Assistant Ranger on the St. Joe National Forest in Idaho in 1935. He worked up through the ranks as Ranger, Assistant Supervisor, Forest Supervisor, and Assistant Director of a Forest and Range Experiment Station in Idaho, Montana, Washington, Oregon, and California.

Mr. Greeley was Regional Forester at Juneau,

Alaska, 1953 to 1956, and Regional Forester at Milwaukee, Wisconsin, 1956 to 1959.

He served as Assistant Chief and as Deputy Chief in charge of the National Forest phases of Forest Service work.

In March 1966, he moved into his present job as Associate Chief of the Forest Service.

In May 1970, he received the USDA's Distinguished Service Award for distinguished leadership and service to America through the development and implementation of public policies with foreign and domestic implications to assure proper management and utilization of our nation's resources.



# ENVIRONMENTAL QUALITY IN AMERICA'S FORESTS

by

ARTHUR W. GREELEY  
Associate Chief, Forest Service  
U. S. Department of Agriculture

In every part of the country, there is concern as to whether this Nation can successfully find the ways to have both a high standard of living and an acceptable level of environmental quality. It is easy to suppose that there has been no previous concern about how to live in harmony with the environment. There are many examples of past foresightedness from which today's decision-makers can show conclusions knowing there is some historic basis for the conclusions.

The Forest Service since its establishment in the U. S. Department of Agriculture 65 years ago has been concerned with the quality of the environment. Through the principles of Sustained Yield and Multiple Use, the National Forests have been managed to provide goods and services for the American people in a way that recognizes the need to maintain harmony with the environment. Today, the 187 million acres of National Forest System lands provide about one-fourth of the Nation's lumber used in homebuilding and other construction; over half the water supply in 18 western States; grazing for both wildlife and domestic livestock; and outdoor recreation for millions of Americans annually. In addition, the Forest Service has worked to promote sound forestry practices on the Nation's 300 million acres of private forested lands.

Among Forest Service programs to protect and enhance the environment are:

*Wilderness:* The Forest Service pioneered the wilderness concept in the early 1920's. When the National Wilderness Preservation System was created by Congress in 1964, it consisted entirely of National Forest land—54 wildernesses containing almost 9 million acres. Today, there are 61 National Forest Wilderness areas with a total of almost 10 million acres, over 90 percent of the entire Wilderness System. In addition, 27 primitive areas with nearly 5 million acres are being studied for suitability for inclusion in the Wilderness System.

*Outdoor Recreation:* The National Forests have been a magnet to draw outdoor recreation users

since the first forests were established. Today the National Forest System provides outdoor recreation for millions of Americans each year. People use the National Forests for camping, picnicking, hiking, swimming and boating, hunting and fishing, skiing and other winter sports, and just enjoyment of the forest environment.

With slightly over 170 million visitor days use in 1970, these forests have 6,880 developed camp and picnic sites with a capacity of 514,471 persons at one time. Over 200 ski areas, including more than 80 percent of the major ski areas in the West, are located entirely or partially on National Forest land.

The Forest Service has developed recreation areas and nature trails tailored to the special needs of handicapped people on 11 National Forests. Three are in New Mexico, two in California, and one each in Colorado, Virginia, Arizona, Utah, Oregon, and Florida.

Nineteen visitor centers provide forest visitors with an understanding of the forest environment through guided and self-guiding interpretive walks and auto tours, amphitheaters, camp fire programs, and wayside exhibits.

*Environmentally Oriented Research:* Well over half of the research conducted by the Forest Service deals with environmental problems. These include such wide-ranging subjects as: the development and testing of insect viruses and sex attractants for use in insect control instead of chemical sprays; operations research on the organization of big firefighting efforts for the better use of today's sophisticated firefighting tools; and constructing mathematical models as a basis to make land use allocation decisions. Other such research includes: testing various logging layouts to find the combination that produces least silting, least road surface, and most efficient use of aerial log transport systems; and determining what people seek in coming to a wilderness area.

These are today's counterparts of early research that set up the methods for managing and restoring depleted western ranges, and which established the relationships between the rate and kind of run-off

from watersheds and the pattern of vegetation use on those watersheds.

*Trees in an Urban Environment:* As part of today's scene, the Forest Service now conducts a number of research programs related to trees in an urban environment. Among them are:

Research on trees as monitors of air pollution and the selection of tree strains that are sensitive to specific pollutants, such as the ponderosa pines of Southern California. These trees have been discovered to be seriously affected by smog from the Angeles Basin. Another example is the white pines in the Southeast, which show acute signs of damage from oxidants, gas emissions, and other pollutants in the air.

Research to discover tree species and strains best suited to withstand smog, which can be used in urban or high-industry areas.

Research on use of trees and shrubs as traffic noise screens. Preliminary research shows noise can be thus reduced by as much as 50 percent.

*Waste Recycling:* A problem that was not considered important only a few years ago is waste recycling. About 60 percent of urban waste is wood fiber materials. Large-scale recycling of used wood fibers can help reduce the Nation's air and water pollution as well as help stretch our forest resources.

The Forest Products Laboratory in Madison, Wisconsin, in cooperation with the City of Madison and the Departments of the Interior and Health, Education and Welfare, is doing research to recover solid wastes from city dumps and convert them into usable materials. As part of this research, the Forest Service has produced a paper that is 100 percent reclaimed wood fiber, and is exploring practical ways to recover this kind of usable waste from city dumps.

*Landscape Architecture:* The Forest Service now employs the largest single force of landscape architects of any agency or organization in the Nation to help ensure that land management and resource harvest practices on the National Forests result in an environment that is in tune with sound conservation practices. One kind of problem is the placement of power lines in the forest landscape and design and placing of telephone structures and gas line pipes. Another is the design of patterns on the land resulting from timber harvest, from range management structures, and from location and planning of fire-break lines through heavily forested areas.

This major effort to use design principles is a natural outgrowth of the change in the last ten years by which clearcutting for more efficient use

of the land's growth potential has replaced in many areas systems of individual tree selection.

*Cooperative Programs:* Private citizens and industry own about 70 percent of the Nation's commercial forest lands—ownerships representing more than 80 percent of the productive forest potential. The location of these lands at lower altitudes than many public forests, in more favorable climatic zones, and closer to urban areas, makes them of prime concern in meeting the future demands of people for forest products and a pleasant environment.

In cooperation with the fifty States, the Forest Service works toward improving the productive capacity of the Nation's forests, and at the same time seeks to extend multiple use management and principles of esthetics to these areas. The Forest Service carries the Federal part of cooperative programs with the States and with private forest land owners to improve fire and insect protection and to help meet the Nation's increasing natural resource needs. The program aims also to reverse the decline in rural employment in forestry and forest-based industry.

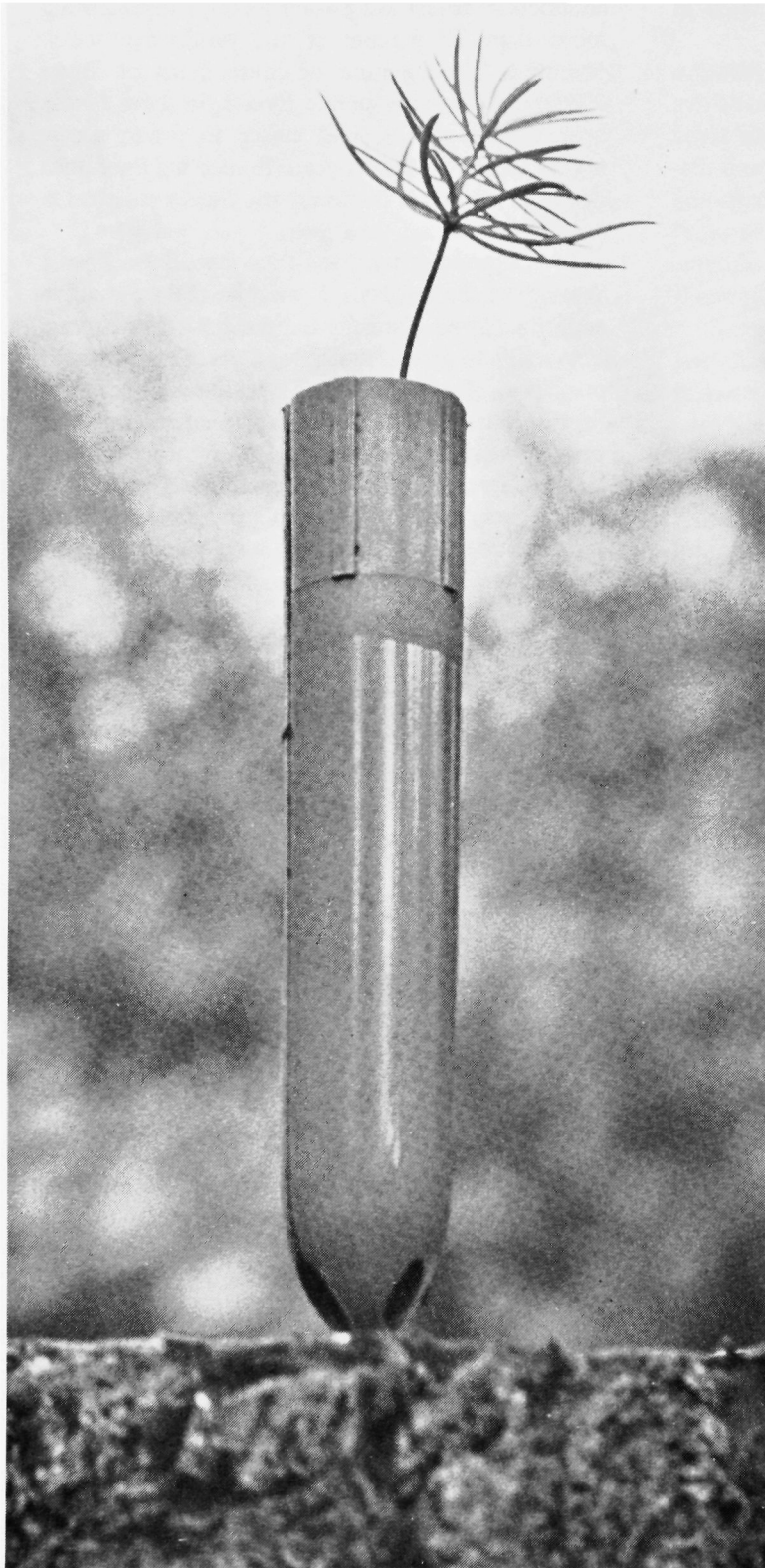
*Looking to the Decade Ahead:* Many of the Forest Service's goals were given Congressional endorsement by the 1960 Multiple Use Sustained Yield Act. This legislation was augmented by the National Environmental Policy Act of 1969, which gave new emphasis to environmental quality. The mandates in this Act are getting serious attention and strong support from the Forest Service.

The Service has outlined its environmental management goals for the Seventies in a major policy statement called, "Framework for the Future." This is a framework for decision-making which aims to keep the Forest Service in tune with the changing resources pressures and to obtain people involvement and knowledge in resource problems.

In harmony with the principles of the Environmental Policy Act, this document strongly emphasizes maintaining the quality of the environment—both in National Forests and other forested lands. Work is now underway to translate these "Framework" goals into a program of action.

In the years ahead, more people with more affluence and more leisure time will bring pressures on our natural resource base far greater than in the past.

Our resources of land, water, vegetation, and wildlife are large—but they are not unlimited. As a Nation, our only choice is to learn the disciplines we must know to use harmoniously for a variety of purposes the fixed land base on which our life depends.



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Good forestry and good foresters are important to G-P, now and as far as we can see into the future.



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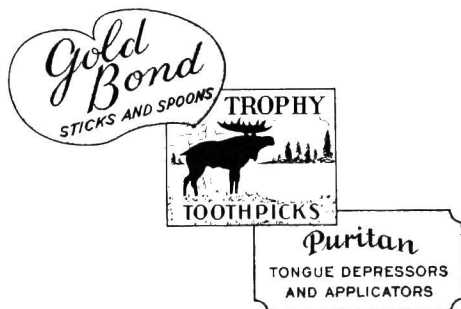
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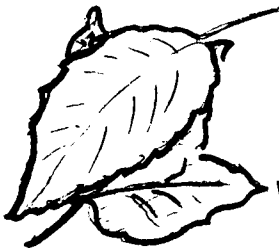
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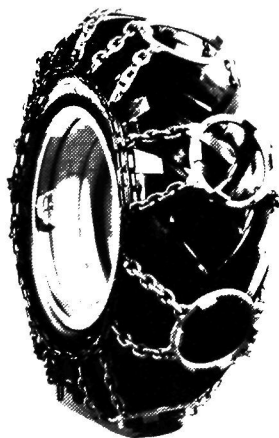
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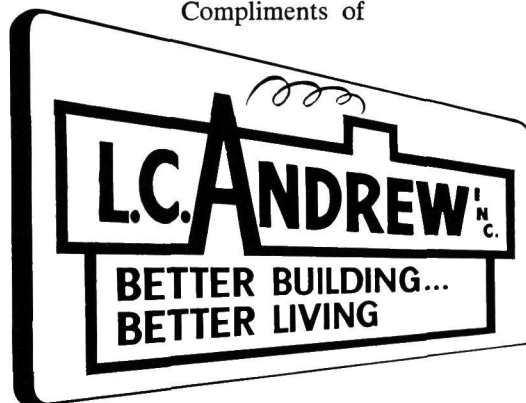
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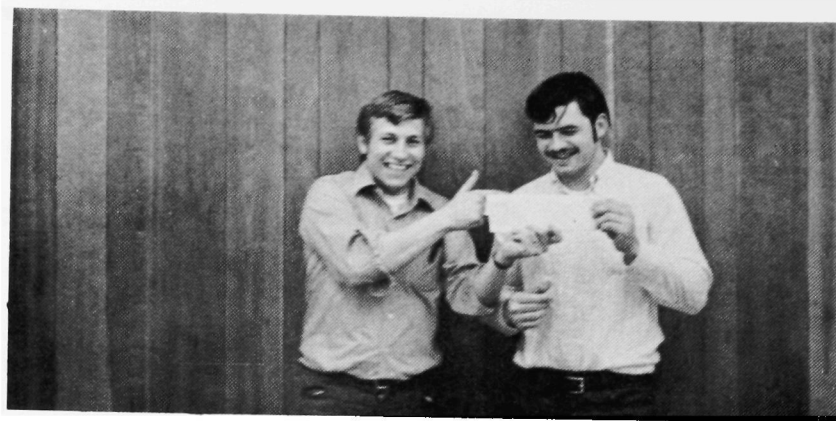
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