REPORT OF THE
COMMISSION STUDYING

The Need for Autonomous School or College Status for the Forestry and Wildlife Program at Virginia Polytechnic Institute and State University

TO THE GOVERNOR AND
THE GENERAL ASSEMBLY OF VIRGINIA

HOUSE DOCUMENT NO. 19

COMMONWEALTH OF VIRGINIA
RICHMOND
1992

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Report of the Commission
studying the need for autonomous school or college status
for the forestry and wildlife program at
Virginia Polytechnic Institute and State University
to
The Governor and the General Assembly of Virginia
Richmond, Virginia
1991

To: The Honorable L. Douglas Wilder, Governor of Virginia,
and
The General Assembly of Virginia

INTRODUCTION AND SUMMARY

Pursuant to House Joint Resolution No. 447 of the 1991 Session of the General Assembly, a commission was established to "study the need for autonomous school or college status for the forestry and wildlife program at Virginia Polytechnic Institute and State University." A copy of HJR 447 is attached as Appendix A.

HJR 447 provided that the commission was to consist of fifteen members as follows: three members from the House of Delegates, to be appointed by the Speaker of the House; two members from the Senate, to be appointed by the Senate Committee on Privileges and Elections; and ten members to be appointed by the governor, one representative each from the Board of Game and Inland Fisheries, the Board of Forestry, the Marine Resources Commission, the Lumber Manufacturers' Association of Virginia, the Virginia Wildlife Federation, the Virginia Forestry Association, the Virginia Agribusiness Council, the Virginia Polytechnic Institute and State University College of Agriculture and Life Sciences, the President of the Virginia Board of Agriculture and Consumer Services, and the School of Forestry and Wildlife Resources at Virginia Polytechnic Institute and State University.

During the course of the Commission's work, the Virginia Polytechnic Institute and State University Board of Visitors approved a resolution recommending that the State Council of Higher Education grant the School of Forestry and Wildlife Resources status as a college equal to that of all other colleges of the university. The schedule recommended by the Board of Visitors for implementing changes in the School's status was in accordance with that suggested by the Proposal for a College of Forestry and Wildlife Resources prepared by the faculty and administration of the School of Forestry and Wildlife Resources. That schedule is as follows: (i) a Dean of the School of Forestry and Wildlife Resources shall be named by January 1, 1992; (ii) the School shall operate with a separately defined annual budget starting July 1, 1992; (iii) the School shall be renamed the College of Forestry and Wildlife Resources on or before July 1, 1993; and (iv) full implementation with staffing be accomplished by July 1, 1994.

At the Commission's second meeting, the following motion was presented:

That the Proposal for a College of Forestry and Wildlife Resources prepared by the faculty and administration of the School of Forestry and Wildlife Resources be endorsed as the Commission's report to the Governor and the General Assembly of Virginia and that it is anticipated that any additional funding required to fully implement the proposal during the transition period between July 1, 1992 and July 1, 1994 be met through private sector initiatives.

The motion was unanimously adopted by the Commission. Consequently, the Proposal for a College of Forestry and Wildlife Resources--dated July 19, 1991, and attached as Appendix B--will serve as the Commission's report to the Governor and the General Assembly.

Respectfully submitted,

Delegate V. Earl Dickinson, *Chairman*
Senator Madison E. Marye, *Vice Chairman*
Delegate A. Victor Thomas
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GENERAL ASSEMBLY OF VIRGINIA--1991 SESSION

HOUSE JOINT RESOLUTION NO. 447

Establishing a commission to study the need for autonomous school or college status for the forestry and wildlife program at Virginia Polytechnic Institute and State University.

Agreed to by the House of Delegates, February 22, 1991
Agreed to by the Senate, February 21, 1991

WHEREAS, forests make up 61 percent of the land area in Virginia and support an industry ranking first in number of employees, and second in total payroll; and

WHEREAS, the forest industries are a major source of employment in our rural communities; and

WHEREAS, the forests also provide the amenities of clean air, clean water, scenic beauty, wildlife, fisheries, and recreational opportunities; and

WHEREAS, forests are renewable, but maintaining their continuing productivity requires a knowledge base of professionals educated in the sciences and arts of natural resources management; and

WHEREAS, research and technology transfer are necessary to keep our hundreds of small wood-based industries competitive and to maintain the quality of our environment; and

WHEREAS, the forestry and wildlife program at Virginia Polytechnic Institute and State University is the only such higher education program in the Commonwealth; and

WHEREAS, the School of Forestry and Wildlife Resources at Virginia Polytechnic Institute and State University is recognized by its peers as one of the top five programs in the nation; and

WHEREAS, the School of Forestry and Wildlife Resources at Virginia Polytechnic Institute and State University is the only top-ranked program in the South which does not have autonomous status within its university system; and

WHEREAS, a separate autonomous college would provide the prestige and visibility needed to attract financial and other support; and

WHEREAS, the General Assembly desires to maintain and enhance programs of excellence within state univerities and is concerned that the lack of autonomy for the School of Forestry and Wildlife Resources may impact adversely this specific program; and

WHEREAS, a separate autonomous school or college could be established at Virginia Polytechnic Institute and State University with little or no additional cost to the Commonwealth; now, therefore, be it

RESOLVED by the House of Delegates, the Senate concurring, That a study commission be established to determine the importance of and need for autonomous school or college status for the program in forestry and wildlife at Virginia Polytechnic Institute and State University. The commision shall take into account the potential impact of the establishment of any such autonomous school or college on the College of Agriculture and Life Sciences. The commission shall be composed of fifteen members. Three members of the House of Delegates shall be appointed by the Speaker of the House of Delegates. Two members of the Senate shall be appointed by the Senate Committee on Privileges and Elections. One representative each from the Board of Game and Inland Fisheries, the Board of Forestry, the Marine Resources Commission, the Lumber Manufacturers' Association of Virginia, the Virginia Wildlife Federation, the Virginia Forestry Association, the Virginia Agribusiness Council, the College of Agriculture and Life Sciences, the President of the Virginia Board of Agriculture and Consumer Services, and the School of Forestry and Wildlife Resources at Virginia Polytechnic Institute and State University shall be appointed by the Governor.

The commission shall submit its findings to the Governor and the General Assembly by December 1, 1991, in accordance with the procedures of the Division of Legislative Automated Systems for the processing of legislative documents.

The Division of Legislative Services shall provide staff support to the commission. All indirect and direct costs of this study shall be paid with private funds.

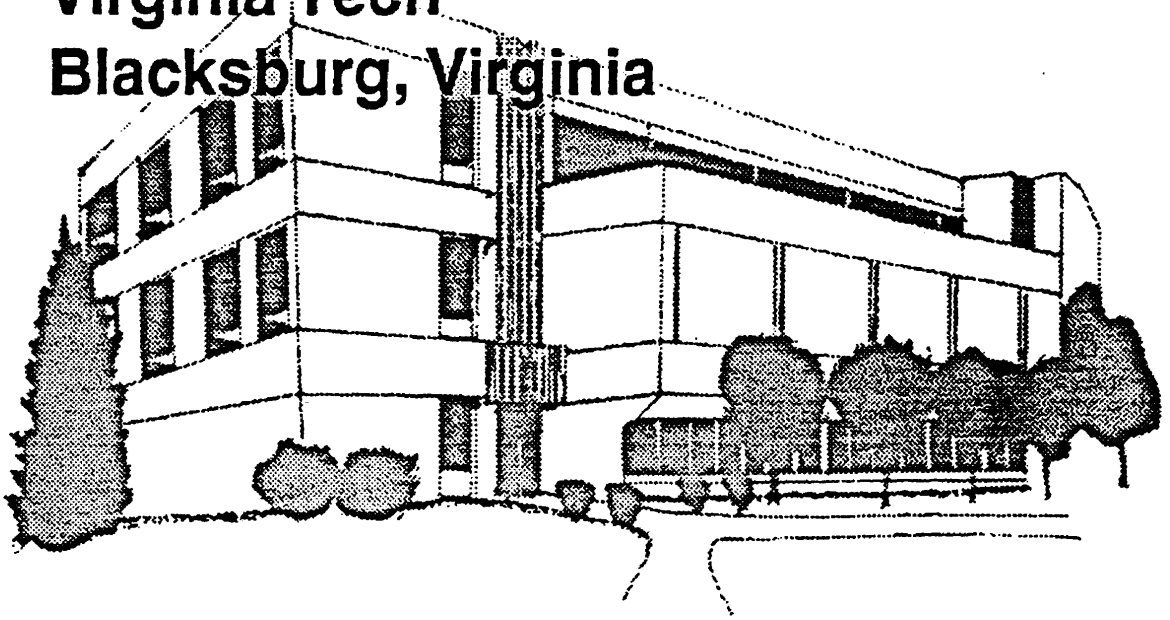
Implementation of this resolution is subject to subsequent approval and certification by the Joint Rules Committee. The Committee may withhold expenditures or delay the period for the conduct of the study.

Proposal

for a

College of Forestry and Wildlife Resources

Virginia Tech
Blacksburg, Virginia



July 19, 1991

Prepared by the faculty and administration of the School of Forestry and Wildlife Resources

EXECUTIVE SUMMARY

This proposal is for collegiate status for the School of Forestry and Wildlife Resources. The proposal describes why collegiate status is important to the university and the Commonwealth, and how and when collegiate status may be implemented. Further, it contains descriptions and supporting statistics to show the attributes of the proposed College of Forestry and Wildlife Resources relative to other campus administrative units and the university.

The School of Forestry and Wildlife Resources is presently an administrative unit in the College of Agriculture and Life Sciences. Since renewable natural resource issues continue to be increasingly important to the people of Virginia, and because the Commonwealth relies heavily on its renewable natural resources for jobs, products, recreation, tourism, and innumerable other tangible and non-tangible benefits, it is important that the land-grant university support and nurture the academic and research infrastructure required to ensure a stable future for the state's economy and a continued guarantee of environmental quality for its citizens. Collegiate status for the present School of Forestry and Wildlife Resources is a significant step towards recognizing the important contributions the university makes in teaching, research, and public service as those activities pertain to Virginia's renewable natural resources.

To this end the proposal seeks the implementation of a College of Forestry and Wildlife Resources on the Virginia Tech campus. Such a College will allow the university to efficiently and directly address renewable natural resources issues and needs. Separation of the School from agriculture will, on the other hand, also allow the existing College of Agriculture and Life Sciences the opportunity to focus on agriculture related issues without limiting future cooperative efforts between the two administrative units.

The proposal calls for a Dean of the School to be named on January 1, 1992 and fiscal autonomy achieved by July 1, 1992. The School of Forestry and Wildlife Resources will be named a College by July 1, 1993. Full implementation of collegiate status will be completed prior to the 1994-1996 biennium. The implementation will require the infusion of 3.5 classified positions into the existing School and the addition of a 0.5 FTE administrative position. Attendant total estimated costs will be less than $150,000/year. These costs represent less than 1.25% of the total budget of the present School. The transition to collegiate status will be significantly minimized because the current administrative structure of the School parallels that of most existing colleges.

As it matures, the proposed College will increasingly contribute to the mission and goals of Virginia Tech. Although the future cannot be forecast with certainty, the students, faculty, and administration of the School envision new and challenging opportunities to serve both the university and the Commonwealth as a College of Forestry and Wildlife Resources.

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I. PROPOSED NAME: *COLLEGE OF FORESTRY AND WILDLIFE RESOURCES*

This name reflects the programs and expertise of faculty in the current School of Forestry and Wildlife Resources and is chosen for the purposes of this proposal. The faculty will consider the name of the proposed College in the Fall of 1991.

II. PROPOSED DATE FOR INITIATING ORGANIZATIONAL CHANGE: *JANUARY 1, 1992*

Full implementation of collegiate status will require approximately two and one-half years. However, an immediate move towards College status can occur because the current administrative organization of the School parallels that of most colleges currently existing on the campus. It is proposed that a Dean of the School be named on January 1, 1992; that the School operate with a separately defined annual budget starting July 1, 1992; the School be renamed the College of Forestry and Wildlife Resources on or before July 1, 1993; and that full implementation with staffing be accomplished by July 1, 1994. This proposal details the initial administrative structure of the proposed College.

III. PROPOSED MISSION OF THE COLLEGE

The mission of the proposed College of Forestry and Wildlife Resources is as proposed in the School's planning document, "An Agenda for the Future 1990-2000", attached as Addendum A. That self-study document articulated the mission of the School as focusing on the long-term development, management, and utilization of renewable natural resources. The tripartite mission is to educate students to be knowledgeable, responsible professionals; to seek, evaluate, communicate, and preserve knowledge; and to assist private and corporate citizens of the Commonwealth, the region, and beyond in resolving problems and nurturing opportunities.

The mission of the proposed College is linked to the three land-grant missions of Virginia Tech: education, research, and public service. Faculty in the proposed College of Forestry and Wildlife Resources will individually and collectively contribute to the Commonwealth's educational needs by offering strong professional programs in renewable natural resources leading to B.S., M.F., M.S. and Ph.D. degrees. The College faculty will continue to seek new knowledge through research, both basic and applied. Extensive involvement in public service will allow the Commonwealth's citizens to benefit from new technology while providing valued feedback to faculty seeking to make teaching and research relevant and challenging to today's student.

The mission and goals of the College of Forestry and Wildlife Resources are consistent with those of the University. The self study document "An Agenda for the Future 1990-2000" lists six goals of the faculty. The School goals articulated in the self-study document will be the goals of the proposed College; their relationship to the university goals are as follows.

School Goal #1. ***To educate high quality professionals who can function effectively in entry-level positions and assume positions of ever increasing responsibility throughout their careers.***

This goal is identical in context and priority to the university's goal of excellent undergraduate education. As the Commonwealth's only institution offering instruction in renewable natural resources education, this goal is central to the mission of the university.

School Goal #2. ***To provide graduate programs that combine a high quality faculty, a student body selected from the best undergraduate degree recipients in this country and abroad, with courses offering the most advanced knowledge in order to produce outstanding researchers, educators, and practitioners.***

This goal, as with Goal #1 above, is consistent with the university's goal of enhancing the quality of graduate and professional education.

School Goal #3. ***To strive for excellence in research through the use and exploration of new scientific concepts and applications for the benefit of society, industry, and government.***

A university goal is "to enhance the quality of the university's programs of research, scholarship, creative expression, and artistic expression." Thus Goal #3 is relevant to the goals of the university as they relate to quality of research and scholarship.

School Goal #4. ***To integrate the College's research program with the teaching program, especially at the graduate level, and with the programs in public service.***

The enhancement of the quality of public service, continuing education, and cooperative education is an expressed university goal. Public service programs are already integral to the individual School departments. The proposed College of Forestry and Wildlife Resources will expand this effective integration of the teaching, research, and public service functions. Although research may be an end in itself, the proposed College's research program will be directed toward providing educational opportunities for students and knowledge for the Commonwealth's citizens and government.

School Goal #5. ***To provide students who are not renewable natural resource majors with an understanding and appreciation of renewable natural resources so they can assume leadership roles in their communities and foster a natural resource conservation ethic within the general public.***

This goal is consistent with the university's objectives of enriching "the intellectual and cultural life of the university" by providing educational experiences for non-majors seeking learning opportunities in the natural resources field.

School Goal #6. ***To disseminate knowledge and to provide new programs of technology transfer to the College's constituencies and to the general public in order to enhance the benefits, goods, and services obtained from the renewable natural resources of the commonwealth and surrounding region.***

This goal complements the university's objective to "strengthen and expand university programs in public service, extension, and continuing education."

IV. BENEFITS OF COLLEGIATE STATUS

The benefits to Virginia Tech of a College of Forestry and Wildlife Resources are as follows.

1. The ability of the university to meet the needs of the Commonwealth as it struggles to cope with management of its renewable natural resources is best served by a College of Forestry and Wildlife Resources.

The School of Forestry and Wildlife Resources faculty and programs are positioned to create an independent, unique program to serve the Commonwealth, the university, our professions, and society. This program would emphasize balanced management of Virginia's forest, fisheries, and wildlife resources. Fueled by rapid population shifts, a large and economically important timber and forest products industry, and conflicting views from an array of special-interest groups, Virginia's renewable natural resources have never before required the intense stewardship that is now demanded by the Commonwealth's citizens.

Natural resources management issues in Virginia are growing in frequency and complexity. Rapid population expansion has increased the relative economic importance of Virginia's forested land base. Use of forested and wildlands will be intensified by continued urban growth paralleled by increased demands for forest products and for forest-based recreational areas for hunting, fishing, and other noncommodity uses. In the coming decades, Virginia will experience tremendous pressure to improve environmental quality, provide more resource-based products, and respond to economic development needs of rural areas.

The National Research Council has recognized the critical need for new programs based on an "environmental paradigm" that emphasizes balanced resource management, development, and stewardship of public and private natural resources. Thus, the mandate for changes in renewable natural resources research, teaching, and public service is national in scope, broad in vision, and temporally and spatially expansive.

Other states with large urban population centers in addition to large forested rural areas have elevated to collegiate status their university programs that deal with natural resources. The reason is simple: natural resources are important to people for their economic and social well-being. Virginia Tech needs a college to provide leadership in the Commonwealth as it weaves the fabric of its future renewable natural resources management policies and programs.

We see collegiate status as a way to capitalize on increased societal interests in earth's resource base. Our interests and expertise uniquely position the university for a leadership role in natural resources research, public service, and policy development. This role cannot and should not go to other universities simply because they are closer to urban areas and to the policy makers or because they have a visibility and image we may lack. No other institution in the state has the collection of expertise and talent of the School's faculty. Collegiate status will foster program growth as well as signal Virginia Tech's leadership role in the Commonwealth and beyond.

2. An independent program will enable Virginia Tech to meet future educational demands for diverse undergraduate and graduate programs in forestry and related renewable natural resources.

Meeting educational needs of Virginia's high school graduates as they seek employment opportunities in natural resources requires that the university operate a highly visible, efficient, and dynamic program. An independent program, separate from the "agriculture image," will allow recruitment of students from nontraditional backgrounds and urban areas. Both traditional areas and new areas of emphasis such as conservation biology and education, urban forestry, wood-based biomaterials, and engineered wood composite products are clearly independent of agriculture. Gaining support and meeting undergraduate demands for courses in these areas requires a visibility that a college of agriculture simply cannot provide.

This university must produce professionals educated to respond to natural resource management questions with intelligent, informed, broad-based decisions. The demand for this education, in terms of student numbers, is increasing. But to benefit from this increase, we must have the special visibility afforded by collegiate status. Our undergraduate and graduate programs are now nearly hidden within agriculture, especially to those outside the university. For us to expand graduate student enrollments and the concomitant financial and technical support for those students, we must be visible, clearly connected to renewable natural resource images, and free to project those images to promising students in nonagriculture programs. Virtually none of our graduate students has had, or will have, expertise in agricultural disciplines.

The need for educating natural resource management professionals is growing and must be met. We are convinced, as are our constituents, that collegiate status will enable us to better meet these needs.

3. Collegiate status will positively enhance our continuing fiscal growth, particularly in research and related gifting.

We have been successful at attracting extramural support. The visibility and prestige of collegiate status will do much to further enhance our efforts. New opportunities for Virginia Tech are on the horizon as industry struggles with natural resources issues and government develops new programs to control renewable natural resources allocations or to protect the Commonwealth's biodiversity. New wood products and resource-based markets have been and will be developed as a direct result of natural resources management challenges. Opportunities for research and public service in the renewable natural resource arena are expanding rapidly.

Faculty serve constituencies ranging from consumers of forest, water, and recreation products, to industrial manufacturers, to nonconsumptive users of ecologic resources. This diversity of representation and orientation is a strength. It is our opinion that we have been successful because of individual faculty strengths. While we expect individual faculty strengths to remain a cornerstone of our success, adding the advantage of a cohesive administrative structure and a clearly defined image will further our collective goal of meeting the research needs of the Commonwealth.

4. A college focused on renewable natural resources management will be the most efficient and effective means to further our role of public service.

Born in biology and fostered by agriculture, the School of Forestry and Wildlife Resources has evolved to embrace a public service mission distinct from that of agriculture. The industrial and nonindustrial landowner constituencies that we support are largely different from those of agriculture. In addition, the federal and state administration and policy makers we educate and otherwise serve are distinct and separate from their agriculture counterparts. We focus on a resource base that is both public and private, and the product objectives and production cycles for wildland are different from those for agricultural land. These distinctions are detailed further in our 10-year plan, developed in 1990 (Addendum A).

Of singular importance is separating the problems and opportunities of natural resources management from the problems and opportunities in the agricultural community. We believe that the issues surrounding natural resources management and agriculture are too large, complex, and divergent for a single administrative umbrella. Public service through extension and continuing education must be enhanced in the renewable natural resources areas. Balanced development of rural economies, service to industry, and environmental quality issues demand university attention. In addition, urban populations must be knowledgeable of natural resource issues. These issues transcend urban and rural distinctions. Issue resolution is integral to the health and financial and social well-being of our society. We believe collegiate status will permit us to acquire the resources needed to address these issues.

5. Collegiate status will allow development of the administrative framework to provide both a focused image to our constituents and a mechanism to accurately project our needs and accomplishments to the University community and our clientele groups.

Only a collegiate dean with an understanding of, and focus on, natural resources management can provide effective faculty leadership. A dean will also be positioned to interact with other deans of forestry and natural resources colleges in the region and the nation in developing program initiatives. A dean is needed to enhance the visibility of Virginia Tech's renewable natural resources educators among our supporting constituencies, within the Commonwealth and throughout the region and nation.

We believe that our accomplishments, needs (e.g., space, financial, and personnel), potential contributions, and image have been, and will continue to be, compromised by continued administrative sieving through an agriculture administration. We seek to independently report our accomplishments and needs to the university administration. We wish to advertise our achievements and potential contributions without accommodation to an agriculture-oriented agenda.

Separation from the College of Agriculture and Life Sciences will, we believe, have benefits for both groups. Faculty will be better represented both within the university's governance structure and to outside interests. Agriculture and forestry deans can separately focus on agriculture and forest/natural resources interests without competing at the college level. Within the current School structure, we have already assumed many responsibilities of collegiate status in such areas as curriculum, student recruitment, student advising, course changes, scholarship development, student placement, and external gifting. As a result, the additional cost of collegiate status will be minimal, but the benefits will be substantial.

The faculty of the School have summarized the rationale for collegiate status as follows:

"We believe that Virginia will see increased conflict between people's needs for commodities and desires for wildland-based spaces. Urban values and economic realities are creating conflicts that only wise management decisions can resolve. While environmental concerns are in the ascendancy so is the demand for wood and other noncommodity natural resources products such as recreation, hunting, and fishing. Jobs provided by natural resource-based industries are critical, as they represent the largest employment sector in the Commonwealth. The wood products industry alone adds $5.2 billion per year to Virginia's economy."

"Virginia Tech now has the faculty and student resources to exert strong leadership in the state and region. We have a strong relationship with constituents on all sides of public policy and technical issues. We are a "collegiate" group of professionals focused on diverse issues, but all rooted in renewable natural resources. Given current administrative changes and faculty momentum, we face a unique opportunity to invest now in an organization that will help Virginia Tech expand as a leader in the Commonwealth and beyond. At the same time, we see that collegiate status represents an opportunity for us as professionals to more effectively influence thoughtful, long-term stewardship of our natural resources through instruction, research, and public service."

V. PROPOSED ORGANIZATIONAL STRUCTURE

Administration

The proposed College of Forestry and Wildlife Resources will co-exist as an equal with the other eight colleges on the Virginia Tech campus. As such, the Dean of the College of Forestry and Wildlife Resources will report directly to the Provost of the university.

The College of Forestry and Wildlife Resources will contain three departments: Forestry, Fisheries and Wildlife, and Wood Science and Forest Products. Each department in the College will have its own department head. This administrative structure parallels that of the existing School of Forestry and Wildlife Resources (Table 1).

On January 1, 1992 a Dean of the School of Forestry and Wildlife Resources will be appointed by the Provost. Initially, the existing School administrative structure will be unchanged but an accounting/personnel officer will be hired Fall 1991 to facilitate the transition of resources from CALS to the School. On or before July 1, 1992, all budgets and other administrative fiscal ties with CALS will be separated. During the next transition year, the Dean will jointly report to the Dean of CALS and the Provost. The School will be named a College of Forestry and Wildlife Resources on July 1, 1993. It is proposed that the College of Forestry and Wildlife shall hire, or otherwise identify, three half-time administrators (Figure 1): Associate Dean for Instruction, Associate Dean for Graduate Studies and Research, and Associate Dean for Extension and Public Service. The Associate Dean positions are positions that are functional in the current organization of the School. The Associate Dean for Instruction is currently titled as Associate Director of the School. The Associate Dean for Extension and Public Service is currently labelled as Project Leader, Extension. Some of the duties of the Associate Dean for Graduate Studies and Research are currently handled by the Chair, Graduate Studies and Research Committee. These positions are compared in Table 1.

Table 1. Current Administrative Positions and Comparisons to the Initial Administrative Organization of the Proposed College.

School	College
Director and Associate Dean, CALS (100% administration)	Dean of the College (100% administration)
Assistant Director (50% administration; 50% faculty)	Associate Dean for Instruction (50% administration; 50% faculty)
Coordinating Counselor (100% administration)	Coordinating Counselor (100% administration)
Chair, Graduate Studies and Research Committee (100% faculty)	Associate Dean for Graduate Studies and Research (50% administration; 50% faculty)
Project Leader, Extension (50% administration; 50% faculty)	Associate Dean for Extension and Public Service (50% administration; 50% faculty)
Department Heads (3) (100% administration)	Department Heads (3) (100% administration)

Total Administrative Appointments:

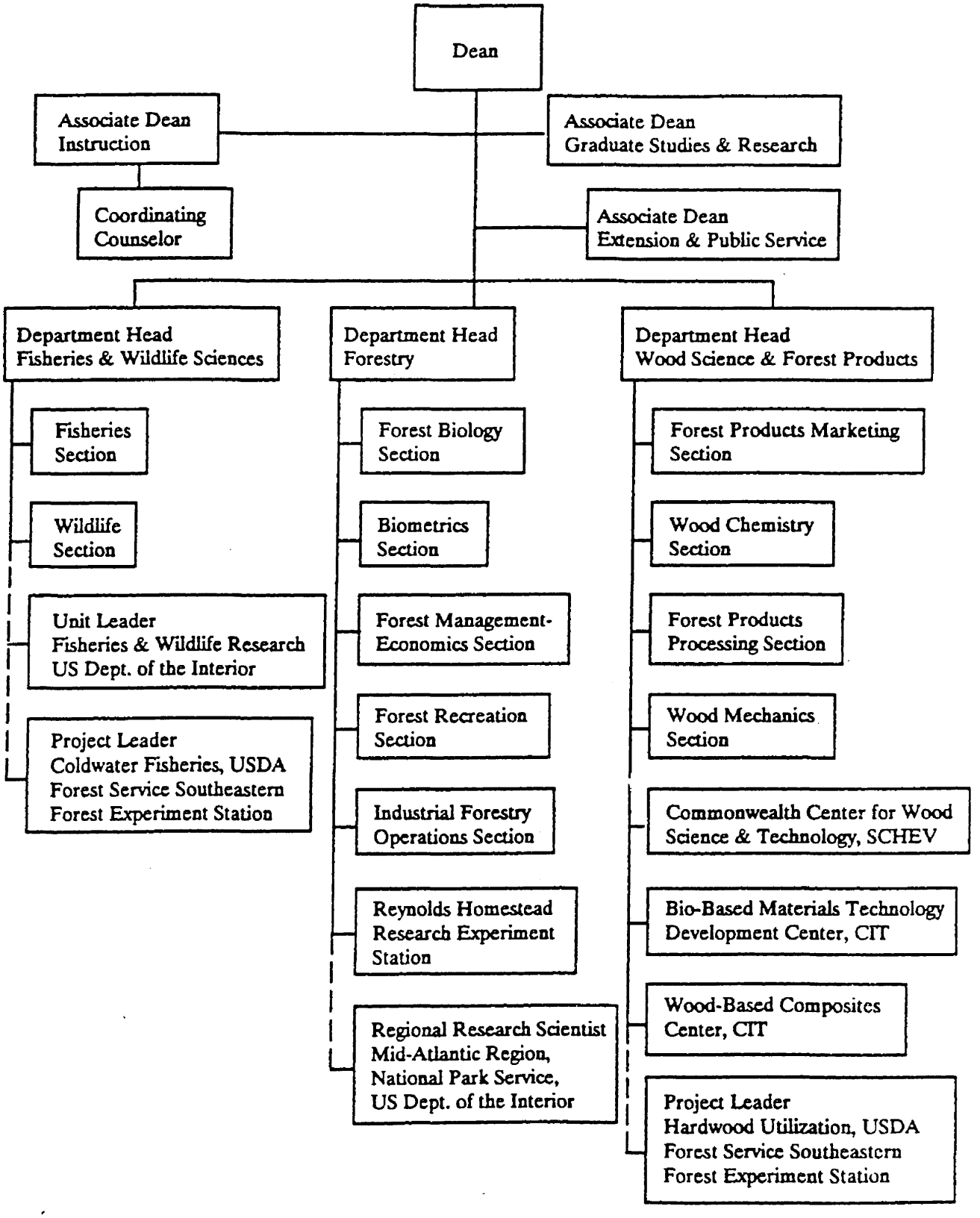
School of Forestry and Wildlife Resources: 6.0 FTE
College of Forestry and Wildlife Resources: 6.5 FTE

Dean's Office Staffing

The following are the job descriptions for the administrative officers of the proposed College:

The Dean of the College of Forestry and Wildlife Resources is responsible for the academic and administrative leadership of the College including teaching, research, and extension/public service programs, faculty, staff, budgets, and facilities. The Dean will administer the McIntire-Stennis Forestry Research Program. The Dean will be responsible for administering development activities in cooperation with department heads and the university development office. The Dean reports to the Senior Vice President and Provost of the university.

Figure 1. College of Forestry and Wildlife Resources Organization Chart



The Associate Dean for Instruction (0.5 FTE) will administer the undergraduate advising program, undergraduate recruitment, scholarship awards, undergraduate independent study, research, and honors programs for the three departments. Other duties will be to serve as the College liaison with the university admissions office, university committees, and university offices dealing with student life and policies. The Associate Dean will be responsible for working with faculty and department heads in the development, improvement, and assessment of undergraduate curricula, and for administering, in cooperation with department heads, all aspects of undergraduate programs in the College. The Associate Dean for Instruction will report to the Dean of the College.

The Associate Dean for Graduate Studies and Research (0.5 FTE) will administer the research and graduate programs of the College. The Associate Dean will facilitate and coordinate research programs; and act as principal liaison between the College, the Graduate School, and the university research division. The Associate Dean of Graduate Studies and Research will develop opportunities for external support of graduate students, coordinate graduate recruitment for the College, and work closely with department heads to ensure maintenance of graduate program quality standards. The Associate Dean for Graduate Studies and Research will report to the Dean of the College.

The Associate Dean for Extension and Public Service (0.5 FTE) will lead, coordinate, develop, and seek support for cooperative extension programs, and public service activities of the College. The Associate Dean will also carry the title of Assistant Director of Extension for Renewable Natural Resources. This person will be responsible for extension planning and reporting, continuing education, budget preparation, and staffing and will administer the Renewable Resources Extension Act funds. The Associate Dean for Extension and Public Service will report to the Dean of the College and to the Director of Cooperative Extension.

Department Heads will be responsible for departmental programs and administering the programs in teaching, research, and extension/public service. They will provide academic leadership for the students, faculty, and staff in developing and strengthening departmental programs. Department heads will serve as principal department liaison with other administrative units in the university, government agencies, industry, and professional societies. Department heads will report to the Dean of the College.

The Coordinating Counselor is responsible for the daily operation of student academic counseling in the College. The Counselor is responsible for class scheduling, ensuring students complete degree requirements, handling degree program changes, advising on course substitutions, evaluating transcripts for transfer students, and generally monitoring the registration process by collating course offerings for each semester in cooperation with department heads, and facilitating student course registration activities. This person will report to the Associate Dean for Instruction.

Classified Staff

The administration of the college will require the addition of a full-time accounting/personnel manager supporting the Dean and department heads. The current annual budget for the School is approximately $12,000,000. Billing, invoicing, personnel matters, payroll, and account maintenance for the School's three departments are currently handled by a single fiscal technician and a secretary. These positions are inadequate to meet the present needs of the School's financial affairs. With collegiate status it is imperative that additional bookkeeping staff be added;

but irrespective of collegiate status, an accounting/personnel manager and bookkeeping staff are needed as soon as possible.

The job description for these staff persons follow:

The Accounting/Personnel Manager will manage accounting work for the College and its three departments. The Accounting Manager will be responsible for the following functional areas: budget preparation, payroll, grants and contracts, accounts payable and receivable, financial reporting, and general accounting operations of the College. The accounting manager will also serve as staff financial liaison with the Virginia Tech Foundation, the office of sponsored programs, the university development office, and the extension division/public service. The manager will be responsible for developing and implementing accounting programs and procedures consistent with university accounting procedures and policies. The accounts manager will report to the Dean. The accounting/personnel manager will be hired by January 1, 1992 to aid the College in the transition phase.

A Bookkeeper is needed to assist the accounting manager and department heads in the daily financial affairs of the College. This staff person will report to the Accounting Manager.

There is a concurrent need for additional staffing in the area of program support and information services. This staff person would generally assist with the external relations of the College's programs. The job description follows:

The Information Officer of the College will support both the graduate and undergraduate programs, as well as work in the areas relating to alumni, development, and public relations. The officer will plan, prepare, and disseminate materials relating to undergraduate and graduate student recruitment in cooperation with department heads and associate deans. The information officer will work with potential employers and students to facilitate placement of graduates. The information officer will be responsible for planning, preparing, and disseminating the College's alumni newsletter, maintaining alumni records, and will serve as College liaison with the university's Alumni Office. The information officer will also assist, in cooperation with department heads, in the preparation of departmental and College annual reports, serve as liaison with the university public information office, and serve in a staff support role for development activities. Additionally, the information officer will promote the programs of the College to the general public, and interact with the media. The information officer will report to the Dean.

A Secretary Senior is needed to support the additional administrative workload. This position will support the Associate Dean for Graduate Studies and Research as well as the Information Officer.

Departmental Staffing

There are no plans for changes in departmental staffing associated with this proposal for a College of Forestry and Wildlife Resources. However, the additional staffing in the financial administration will directly aid departmental administration.

Financial Requirements for Implementation

Implementation of College status by July 1, 1992 requires allocating a 0.5 FTE administrative position and 3.5 classified staff positions. Salaries associated with these positions are:

a. $38,000 for 0.5 FTE Associate Dean of Graduate Studies and Research.

b. $35,000 for full-time accounting/personnel manager (classified).

c. $30,000 for a full-time information officer (classified).

d. $10,000 for a 0.5 FTE bookkeeper (classified).

e. $18,000 for a 1.0 FTE secretary (classified).

Total funds for implementation are estimated as $131,000.

Operating Budget

Apart from the new positions listed above, the budget of the proposed College of Forestry and Wildlife Resources will initially be that of the current School of Forestry and Wildlife Resources including all subordinate units, recognizing the need to fill as soon as possible the nine faculty positions vacated by attrition during the recent budget cuts. If vacant positions can be restored, greater flexibility in staffing the new College and meeting program needs will be possible. By July 1, 1994, all administrative and classified positions outlined above will be filled. The University will include in the 1994-1996 biennium budget all positions and expenses associated with the new College administration.

VI. RELEVANCE TO RESOURCE ALLOCATION CRITERIA

The Senior Vice President and Provost's position paper of April 11, 1991 outlines the criteria to be used in making resource allocations and reallocation decisions. This section addresses those criteria as they pertain to the formation of a College of Forestry and Wildlife Resources. As stated earlier, this proposal for a College does not involve immediate or significant allocation or reallocation of positions or financial resources among university programs.

Consistency With the University's Goals

Item III of this proposal shows that the mission and goals of the proposed College are consistent with, and complementary to, the mission and goals of the university. There is no conflict between the university's role in teaching, research, and public service and that of the proposed College of Forestry and Wildlife Resources. In fact, the goals of the proposed College will significantly aid the university in achieving a leadership role in the Commonwealth as that role pertains to the stewardship of renewable natural resources. The proposed College will train, educate, and provide continuing public assistance to natural resources managers. It will

promulgate the wise economic use of renewable natural resource products and materials by developing new technologies and markets. It will ensure sustainable levels of commodity and non-commodity products from the Commonwealth's renewable natural resource base by providing quality educational opportunity to students in the state and region at both the undergraduate and graduate levels.

Program Quality

The present School of Forestry and Wildlife Resources is an acknowledged leader in forestry, forest products, and wildlife education and research. It is a leader because faculty and staff possess credentials of outstanding quality and an experiential base representing a broad array of natural resource related disciplines. Each year the three departments of the School publish annual reports to an Advisory Board. These documents, available on request, frame for the 1990-91 year the research breadth, creative and professional achievements, excellence in teaching, and public service accomplishments of the faculty. Further documentation of the quality of programs conducted by faculty and their credentials are available.

The curricula and programs in the proposed College are sound and founded on a philosophy emphasizing individual faculty strengths in teaching, research, and public service. Every effort is made to ensure high academic standards in undergraduate course work. Graduate program quality is ensured because the faculty set the highest possible entrance requirements for entering students and follow a well-defined policy to ensure program quality maintenance. These specific procedures are outlined in the School's March 1, 1988 response to Policy Memorandum #14 *"Policy Change: Supervision and Maintenance of Quality Standards in Graduate Programs"* (on file in the Graduate School). The School's excellence in undergraduate and graduate programs is evidenced by the outstanding employment and personal career records of its graduates. All programs in the proposed College are accredited by their respective professional accrediting agencies (the revised outdoor recreation option meets the accreditation standards of the National Recreation and Park Association and is currently in provisional status for the required three year period).

The quality of the present School has been monitored regularly by a 60-member Advisory Board. Based on the advice of that Board, changes have regularly been made in the undergraduate programs. Examples include the School's writing program, computer literacy program, and the development of the various options in the School's undergraduate program.

In 1987, the Advisory Board conducted an independent survey of all forestry, forest products, fisheries, and wildlife programs in the U.S. Leaders of these programs were asked to rank U.S. programs based on their perception of overall quality. All School programs were ranked in the top five in the country; fisheries and wood science/forest products were ranked number one.

Students in the School form a cohesive group which identifies with renewable natural resources. As might be expected, their foci are along departmental lines and largely take the form of curriculum club membership. Attached is a program from the 1991 Annual School Banquet which illustrates the diversity, academic quality, and professional orientation of the proposed College's student body (Addendum B).

Students in the proposed College will benefit from the large number of outside contributors who generously support the current School programs. This support takes many forms, including facilitation of cooperative learning experiences, scholarships, research awards, and unrestricted gifting.

Program Improvement

The faculty and administration of the School of Forestry and Wildlife Resources recognize the need for periodic review of programs, goals, and objectives. The attached "Agenda for the Future 1990-2000" is but one example of the School's review process. Faculty committees, both standing and *ad hoc*, periodically review local aspects of programs, course contents, and related programmatic items to ensure students receive a relevant, high quality learning experience at Virginia Tech. Within the past two years, the review process has resulted in the dropping of two program options and the addition of a new option in outdoor recreation. Thus, the programs in the proposed College are led by a dynamic faculty who continually search for and pursue program improvements.

The faculty of the proposed College conduct, on a recurring basis, peer reviews of teaching. Coordinated by department heads, these reviews are designed to assist faculty in developing pedagogic techniques. Faculty are reviewed by students at the conclusion of each course and those reviews also allow faculty self-improvement. Prior to graduation, "exit" interviews are conducted. These interviews are also helpful in evaluating programs.

Other indicators of the present School's dedication to continued review and evaluation of its programs is evidenced by:

1. Annual reviews by a 60-member Advisory Board.

2. Five-year reviews by the Cooperative State Research Service of the United States Department of Agriculture. Although these reviews are required only for research, the School requests they be comprehensive.

3. Accreditation reviews by the various accrediting bodies in the proposed College's disciplinary areas, including the Society of American Foresters, Society of Wood Science and Technology and other similar groups.

4. Special reviews, evaluations, and study visits to assist in planning for the emerging trends and program demands.

Enrollment

Enrollment in the School of Forestry and Wildlife Resources has fluctuated over the years. These fluctuations are largely explained by varying public awareness of environmental issues and may also be due in part to high school students' perceptions of employment opportunities in agriculture and forestry. When the Department of Forestry was founded in 1959, 71 students were enrolled. When the School of Forestry and Wildlife resources was formed in 1976, 1,129 students were enrolled. In 1990, 570 students comprised the School in its three departments. Figure 2 shows the enrollment trends from 1959 to 1990. The major increase in enrollment in the 70's was tied to increased environmental awareness. As the 90's are witnessing a resurgence of environmental interest, it is anticipated that the enrollment in the College will exceed 700 undergraduate and 150 graduate students by the year 2000. Over the past three years, enrollment has increased at an average rate of approximately 18%.

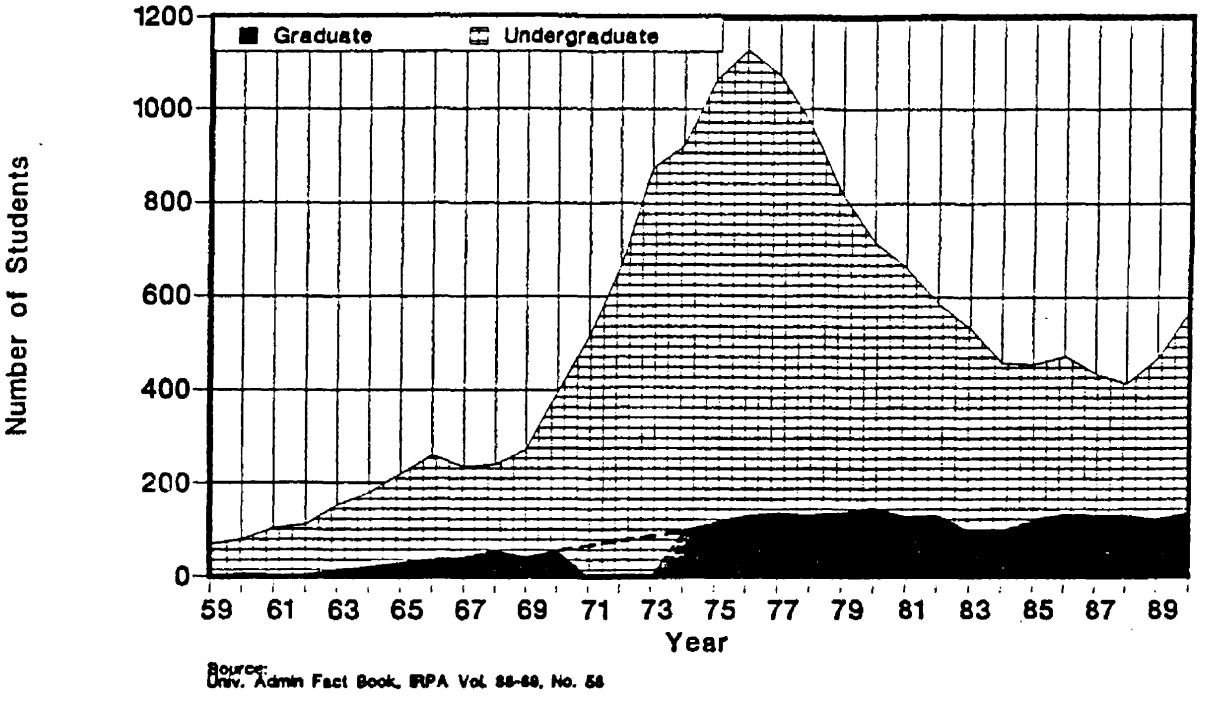


Figure 2. Fall Term Enrollment, School of Forestry and Wildlife Resources, 1959-1990. (Note, IRPA data for graduate student enrollment for 1971-1973 are incomplete.)

Academic, Professional, and Social Need

The School of Forestry and Wildlife Resources serves five distinct professional groups: Fisheries, Forestry, Outdoor Recreation, Wildlife, and Wood Science and Forest Products. Each of these professional groups is represented by a professional society, each addresses issues at local, state, regional, national, and international levels, and each has its own accreditation procedures for university programs. Fisheries interests are represented by the American Fisheries Society. Their focus is the management of living aquatic resources and the culture of aquatic organisms. The forestry profession is represented by the Society of American Foresters which is concerned with the management and use of resources on and in association with forest lands. The National Recreation and Park Association is the accrediting association for the outdoor recreation program. It addresses recreational needs, leisure-pursuit issues, and other non-commodity benefits of forest lands. The Wildlife Society represents wildlife interests, and is concerned with issues surrounding the management of natural resources for the provision of wild animals, both game and non-game species. Several societies represent the interests of programs and faculty in Wood Science and Forest Products. Among these are the Forest Products Research Society, the Society of Wood Science and Technology, and the Technical Association of the Pulp and Paper Industry (TAPPI).

The social need for a College of Forestry and Wildlife Resources has been articulated by the faculty statement found in Section III of this proposal. Both the faculty and the administration of the present School of Forestry and Wildlife Resources support the notion that there is a strong societal need for the educational opportunities and public services a College of Forestry and Wildlife Resources can provide. College level visibility is needed for the university to assume a truly significant role in resource policy development for the Commonwealth and the mid-Atlantic region.

The faculty's "Agenda for the Future 1990-2000" reported on anticipated trends thought most likely to impact the natural resources professions. These trends include increased environmental awareness, greater diversity of natural resource products and uses, intensified use of lands, and increased regulation of private lands. The problems and conflicts associated with these trends will likely feed the research programs of the proposed College in the near future, and will increasingly affect the way curricula are developed and courses taught.

Virginia's forest and wildlife resources and the industries that are associated with those resources are significant. For example, within the Commonwealth, forest-related industry ranks first in manufacturing employment, first in total salary and wages, third in value added by manufacturing and fifth in capital investment with nearly 1000 plants. At least 150,000 jobs are directly and ir directly related to the Commonwealth's forests. Hunting, fishing, and other recreational uses associated with forest lands have an estimated impact of nearly one billion dollars on the state's economy. Other examples of the importance of renewable natural resources to the Commonwealth's economic base abound and are reported in "Virginia's Forest and Wildlife Resources" by O.F. Hall et al. Suffice it to say, a College of Forestry and Wildlife Resources is a needed institution to serve the professional employment, continuing education, and policy assistance needs of these renewable natural resource industries.

Student interest in educational programs offered by the proposed College is high, and demands for the educational opportunities afforded by the proposed College is anticipated to increase over the next decade. At the graduate level, more than 1,000 inquiries about graduate study opportunities are processed each year. Projected undergraduate enrollment in the proposed College is anticipated to be in excess of 700 students by the year 2000. In addition, some undergraduate freshmen/sophomore level courses in the current School have up to 20% enrollment by non-majors. Thus there is a demand on campus from non-majors for elective courses in the natural resources areas.

Adequacy of Resources

This proposal assumes all resources currently allocated to the School of Forestry and Wildlife Resources will be part of those allocated to the new College. This includes all personnel resources, space and financial. Some comments regarding resources follow.

Personnel

Classified Positions

Relative to the College of Agriculture and Life Sciences, the current School of Forestry and Wildlife Resources has relatively few classified positions. In 1991 there were 0.57 classified positions for each faculty position. This ratio is considered low for field-oriented research programs and will likely be a focal point for future College staffing discussions. However, no new

classified positions (other than those enumerated under the administrative needs section of this proposal) are integral to the formation of a College of Forestry and Wildlife Resources.

Faculty Positions

Instructional Positions: Since 1982, the School of Forestry and Wildlife Resources has lost instructional positions; in contrast, the College of Agriculture and Life Sciences has gained instructional positions (Figure 3 and Table 2a and 2b). The School's current instructional workload (WSCH/allocated 208 FTE) is comparable to that of the College of Agriculture and Life Sciences, and is beneath the university average. No additional instructional positions are integral to the conversion to collegiate status.

Research Positions: The research program of the School has grown continuously over the years. Research expenditures have increased from $3.2 million in 1984 to more than $8.1 million in 1990 (Figure 4). During this period, the School sponsored program expenditures grew over 250%, a figure slightly higher than the growth of the university sponsored program expenditures as a whole (H. T. Hurd, Office of Sponsored Programs). Federal McIntire-Stennis support experienced an approximate 35% increase in 1989. State contributions to research in the School are less than 50% of total research expenditures. The formation of a College will not require additional research positions. As opportunities arise in the future, additional research positions will likely be requested, consistent with need. Table 2b shows current filled research positions in the School of Forestry and Wildlife Resources.

Extension Positions: Since 1989 the School has lost three extension positions due to budget reductions and the inability to fill vacant positions (Table 2b). While filling these positions is not a prerequisite to collegiate status, staffing in extension is, and will continue to be, an important program concern.

Space

Space resources in the proposed College, like those of the university as a whole, are considerably below SCHEV guidelines. Figure 5, provided by Facilities Planning, shows that the School of Forestry and Wildlife Resources has not participated in any net growth of assignable space over the past decade. Since 1982 the total number of faculty and graduate full-time equivalents has grown over 32% (Admin. Fact Book). Not fully included in these statistics are the additional faculty and graduate assistants added through the Commonwealth Center, the Biobased Materials Center, and special initiatives in aquaculture and forestry. In addition, the U.S. Forest Service and the Department of the Interior have recently established very beneficial research work units within the School, also adding to the space shortage.

These additions have been accommodated in the usual manner by renovating existing space, largely utilizing operating dollars. However, future growth of the proposed College, particularly in research, will require new space. This will be the case regardless of College status. Nevertheless, assuming that all space currently assigned to the School is transferred to a new College of Forestry and Wildlife Resources, no additional space will be required to implement collegiate status.

Table 2a. Allocated 208 Instructional Positions. (Source: Acad. Admin. Fact Book)

Year	SFWR	CALS(-)	University
1982	29.64	83.01	1438.49
1983	27.45	80.81	1440.47
1984	28.05	79.01	1435.29
1985	28.08	82.16	1464.87
1986	28.12	85.59	1496.62
1987	26.81	86.47	1500.17
1988	27.19	88.28	1515.78
1989	26.85	89.35	1532.92
1990	26.18	86.08	1470.47

CALS(-) = College of Agric. and Life Sci. less SFWR.
SFWR = School of Forestry and Wildlife Resources.

Table 2b. Summary of all filled[1] faculty and support FTE positions in the SFWR[2] funded by State and Federal appropriations. (Source: College of Agriculture and Life Sciences)

	Faculty[3]				Support Personnel				Grand Total
Year	208	230	231	Total	208	230	231	Total	
1989	22.69	23.56	12.22	58.47	9.00	22.08	3.50	34.58	93.50
1990	22.69	26.83	10.13	59.65	9.00	23.50	3.00	35.50	95.15
1991	21.69	24.23	9.23	55.15	9.00	20.50	2.00	31.50	86.65

[1] In addition to the filled positions, there are usually several allocated but unfilled positions during any given year.

[2] SFWR is composed of the Departments of Forestry, Wood Science and Forest Products and Fisheries and Wildlife, plus Reynolds Homestead Center and the Commonwealth center.

[3] All Faculty as defined in Section 2 of *Faculty Handbook* except Visiting Professor and Adjunct Professor.

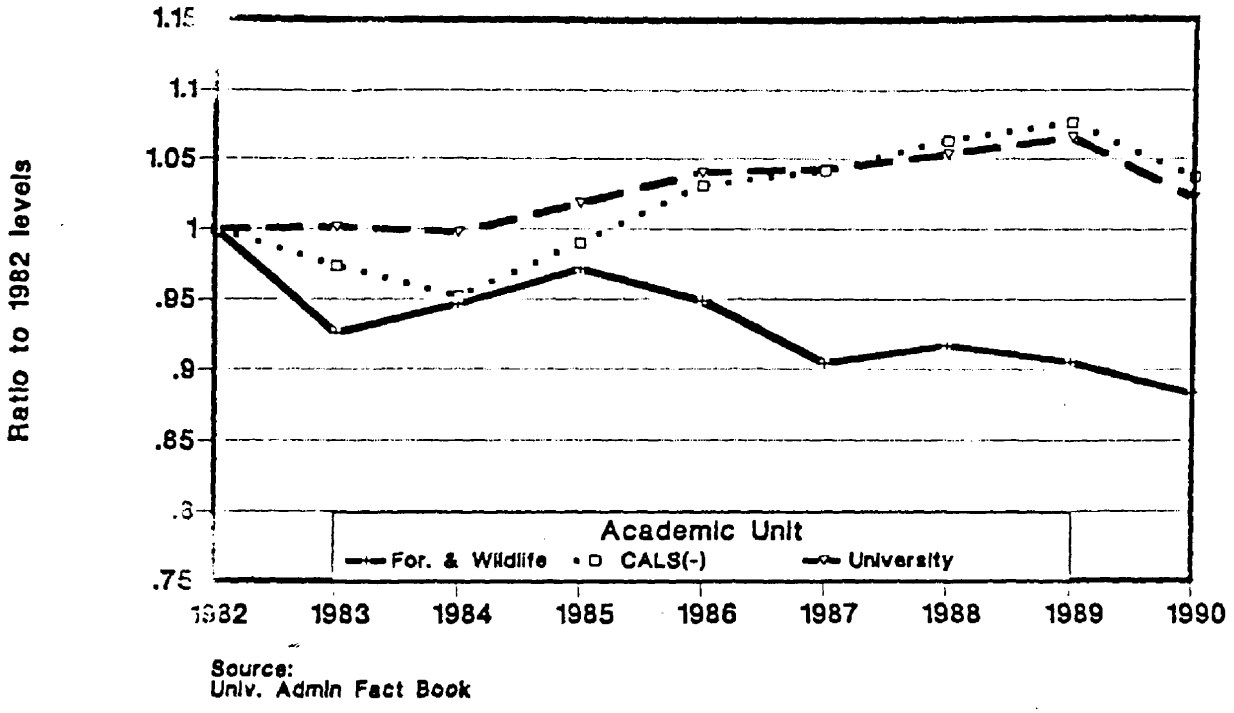


Figure 3. Allocated 208 Instructional Positions. (Only instructional departments included.)

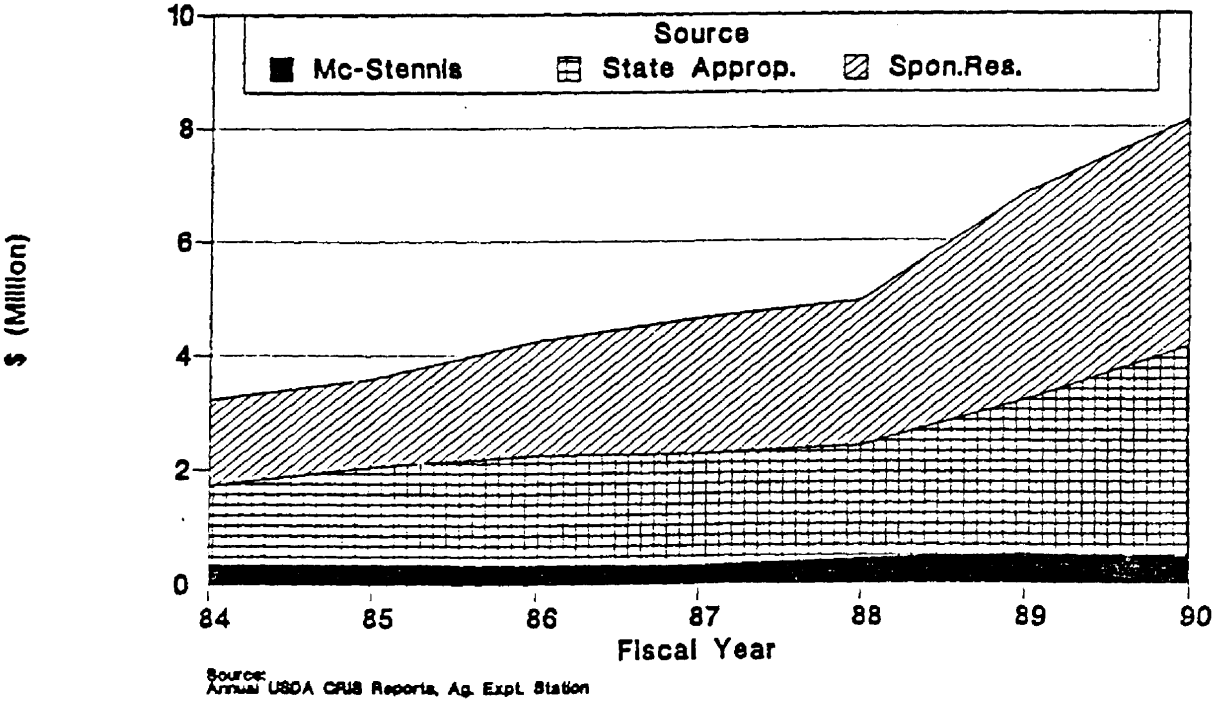


Figure 4. Research Expenditures. School of Forestry and Wildlife Resources.

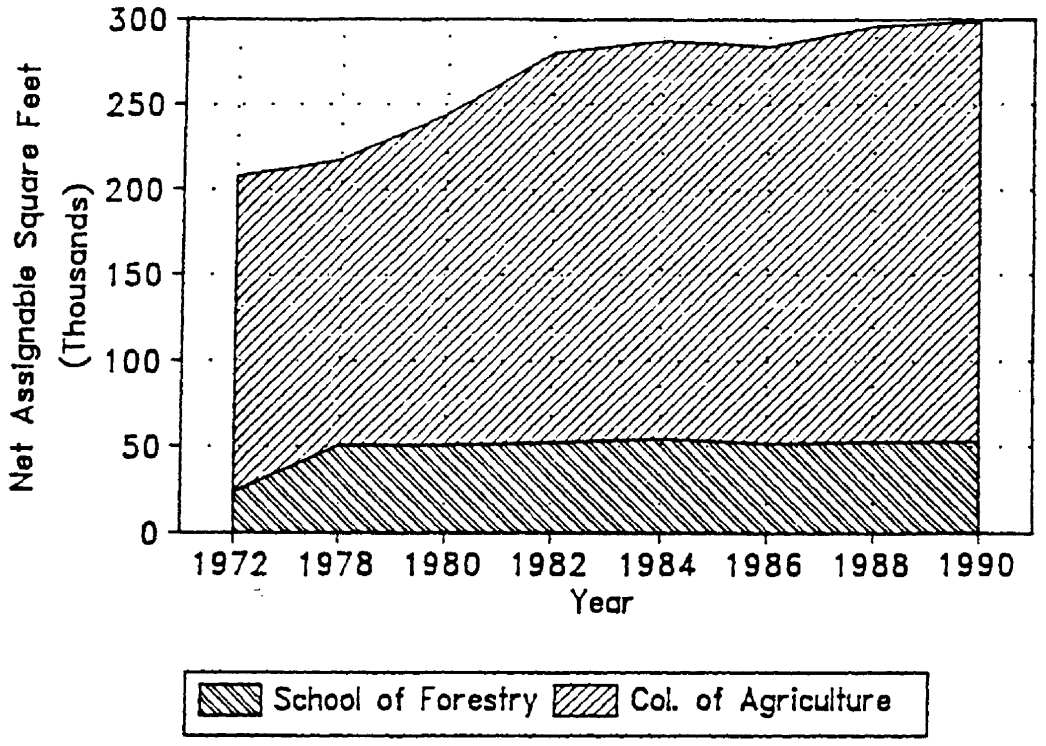


Figure 5. Net Assignable SCHEV Guideline Space, 1972-1990. (Source: Facilities Planning.)

Budget

Operating/Other Budgets

Assuming that all budgets, allocations, and accounts of the current School are transferred to the College or Forestry and Wildlife Resources, then no additional resources are needed for initial implementation of collegiate status. Longer term, the budget must expand as described in Section V.

Computer Fund Allocations

The present School has received from the College of Agriculture and Life Sciences approximately 95% of the funds it needs to support its teaching, research, and extension computing needs. To ensure full coverage of central computing expenses it is estimated that allocations for FY 1992-93 will need to be: Teaching, $130,000; Research, $80,000; Extension, $10,000. These amounts represent only a very small increase over current allocations.

Program Planning

Program planning is an ongoing process in the current School of Forestry and Wildlife Resources; collegiate status will not change that. The "Agenda for the Future 1990-2000" will serve as a guide to the formulation of specific programmatic changes that faculty and administrative leaders may propose. There are several opportunities for growth in the proposed College and these are articulated under Exceptional Opportunities. These areas of exceptional opportunity will be examined and appropriate programmatic changes and additions made following faculty and administrative review.

College Management

The proposed College of Forestry and Wildlife Resources will be managed using an administrative structure modelled on existing colleges in the university. The administrative hierarchy is shown in Figure 1 of Section V of this proposal.

Exceptional Opportunities

The faculty and administration of the proposed College of Forestry and Wildlife Resources will continue to forecast trends in the renewable natural resources areas and to determine which of these demand changes in the teaching, research, and extension/public service programs. The "Agenda for the Future 1990-2000" outlined some future trends which faculty believe will significantly impact the proposed College's programs. These trends include: increasing environmental consciousness, increased diversity of natural resource products and uses, intensified land use, and increased regulation of private lands. Trends, coupled with increased influence of government in natural resource planning and regulation, a rapidly increasing information base, and increased world-wide cooperative efforts in natural resource management, will create innumerable opportunities for future expansion of programs.

In the near future, forestry programs will likely be asked to respond to several issues. Among these will be evaluating best management practices, measuring the effects of global warming and pollution on forest productivity and health, developing the urban forest concept, protecting and enhancing non-timber resources, and developing environmentally sensitive methods of timber harvesting.

Fisheries and wildlife programs will be faced with many issues, one of the more important of which will be the issue of biodiversity, including endangered species management. Developing methods to measure, conserve, and enhance biodiversity will be a central interdisciplinary effort. The integration of land and water management techniques and development of teaching and research programs to affect technology transfer will be important near-term opportunities which will guide program development. Economic, social and political factors impacting non-consumptive natural resources use will continue to be fruitful areas of program development.

Wood science and forest products research, teaching, and extension programs are faced with challenging opportunities in manufacturing and marketing, chemical and biochemical conversion, engineered wood products, and process control and information systems. Founded on the premise that wood conversion to useful and necessary products for society must be efficient if forests are to be conserved, new technologies must be developed and present technologies transferred to the

manufacturing and marketing arenas. This will require new research, enhanced public service/extension activities, and continued updating of courses. Expansion of marketing to foreign markets will also require concentrated efforts.

VII. ACADEMIC PROGRAMS OFFERED

Program Priorities

Program priorities for the new College are outlined in the attached "Agenda for the Future 1990-2000" (Addendum A). The present School has prospered by anticipating future needs for research, teaching, and extension. This will continue in the future. At the present time new thrusts being examined include the areas of furniture manufacturing, aquaculture, conservation of renewable natural resources, conservation education, outdoor recreation, urban forestry, and wood products recycling.

Past and Projected Future Enrollments

Figure 6 and Table 3 present data illustrating the changes in student enrollments for the School using a 1982 base of 586. Since 1988, enrollments have increased significantly; it is expected that by the year 2000 the proposed College will have over 700 undergraduate students and 150 graduate students.

Faculty Workload Trends

Teaching loads of the School faculty are currently less than those of the university but are comparable to those of the College of Agriculture and Life Sciences (Figure 7 and Table 4). The administration of the School believes that within one or two academic years, WSCH/208 FTE will be equivalent to the university average. This is owing to the relatively rapid growth of the student body in the School and to the considerable non-major enrollment in some undergraduate courses. Figure 7 shows that there has been a decline in WSCH/208 position in the College of Agriculture and Life Sciences since 1982, but the School of Forestry and Wildlife Resources has improved. Further improvements are anticipated.

Undergraduate and Graduate Qualifications

Undergraduate students entering the School of Forestry and Wildlife Resources are of high caliber, with average SAT scores for the entering 1991 class of 1070. Entering students had a average class rank in the 81st percentile, an average equivalent to the university average. Table 5 shows profiles of the 1985-1991 entering classes and compares the School of Forestry and Wildlife Resources with the College of Agriculture and the University. Graduate students entering the present School of Forestry and Wildlife Resources are of exceptional quality. The average QCA of accepted students has exceeded the university and College of Agriculture and Life Sciences average every year since 1981 (Table 6).

Table 3. Number of Student Majors, Fall Term. (Source: Acad. Admin. Fact Book)

	SFWR			CALS(-)			UNIV		
Year	Ugrad	Grad	Total	Ugrad	Grad	Total	Ugrad	Grad	Total
1982	454	132	586	1149	364	1513	18102	2987	21305
1983	433	100	533			1472			21357
1984	361	98	459	1100	307	1407	18079	2945	21335
1985	332	124	456			1428			22044
1986	338	136	474	932	318	1250	18310	3673	22302
1987	305	132	437			1276			22702
1988	283	132	415	865	317	1182	18149	3863	22154
1989	344	125	469	835	313	1148	18574	4037	22922
1990	431	139	570	851	327	1178	17168	4099	21577

CALS(-) = CALS less SFWR

Table 4. Fall Term Weighted Student Credit Hours (WSCH)/Allocated 208 FTE (Instructional Departments Only). (Source: Acad. Admin. Fact Book)

Year	SFWR	CALS(-)	UNIV
1982	222.60	301.19	323.13
1983	209.87	272.55	326.70
1984	158.68	279.19	326.48
1985	174.48	253.40	328.70
1986	183.36	226.22	326.90
1987	181.72	236.58	332.97
1988	193.53	225.38	317.94
1989	200.37	236.87	322.44
1990	241.63	243.45	345.97

Table 5. Comparative Profiles of Freshman Students Accepting Admission to Virginia Tech, 1985-1990. (Source: School records, registrar.)

Unit	1985	1986	1987	1988	1989	1990	1991
School of Forestry and Wildlife Resources							
SAT	1055	1053	1089	1059	1071	1081	1070
Verbal	513	509	526	510	511	512	514
Math	542	544	563	549	559	568	556
Average Class Rank (%)	27	30	14	19	17	17	19
College of Agriculture and Life Sciences							
SAT	1062	1060	1069	1047	n/a	n/a	1063
Verbal	---	511	514	497	n/a	n/a	506
Math	---	549	555	550	n/a	n/a	556
Average Class Rank (%)	20	18	16	20	16	18	17
University							
SAT	1084	1104	1122	1098	n/a	n/a	1092
Verbal	---	514	520	508	n/a	n/a	504
Math	---	590	602	590	n/a	n/a	588
Average Class Rank (%)	19	17	16	17	17	18	19

Table 6. Comparisons of Graduate Students Accepted into School of Forestry and Wildlife Resources with College of Agriculture and Life Sciences and the University. (Source. Graduate School). QCA = Quality Credit average (last 60 hours); V = Verbal Scores GRE Exams; Q = Quantitative Scores GRE Exams. (NOTE: GRE exams are not required for admission.)

Year		Forestry & Wildlife	College	University
1981	QCA	3.5061	3.4409	3.3047
	V	510	520	517
	Q	632	614	641
1982	QCA	3.5808	3.3731	3.3185
	V	563	530	521
	Q	637	605	635
1983	QCA	3.5932	n/a	3.2922
	V	530	n/a	539
	Q	648	n/a	648
1984	QCA	3.5429	3.3653	3.2958
	V	564	533	539
	Q	658	624	663
1985	QCA	3.3860	3.3802	3.2908
	V	536	533	531
	Q	597	628	667
1986	QCA	3.4118	3.3356	3.2949
	V	487	501	522
	Q	658	607	679
1987	QCA	3.4058	3.3215	3.2763
	V	540	498	516
	Q	660	621	678
1988	QCA	3.4666	3.3683	3.2594
	V	462	476	517
	Q	611	615	670
1989	QCA	3.5443	3.3723	3.2919
	V	538	502	528
	Q	655	633	682
1990	QCA	3.5970	3.3572	3.2872
	V	514	518	525
	Q	669	638	677

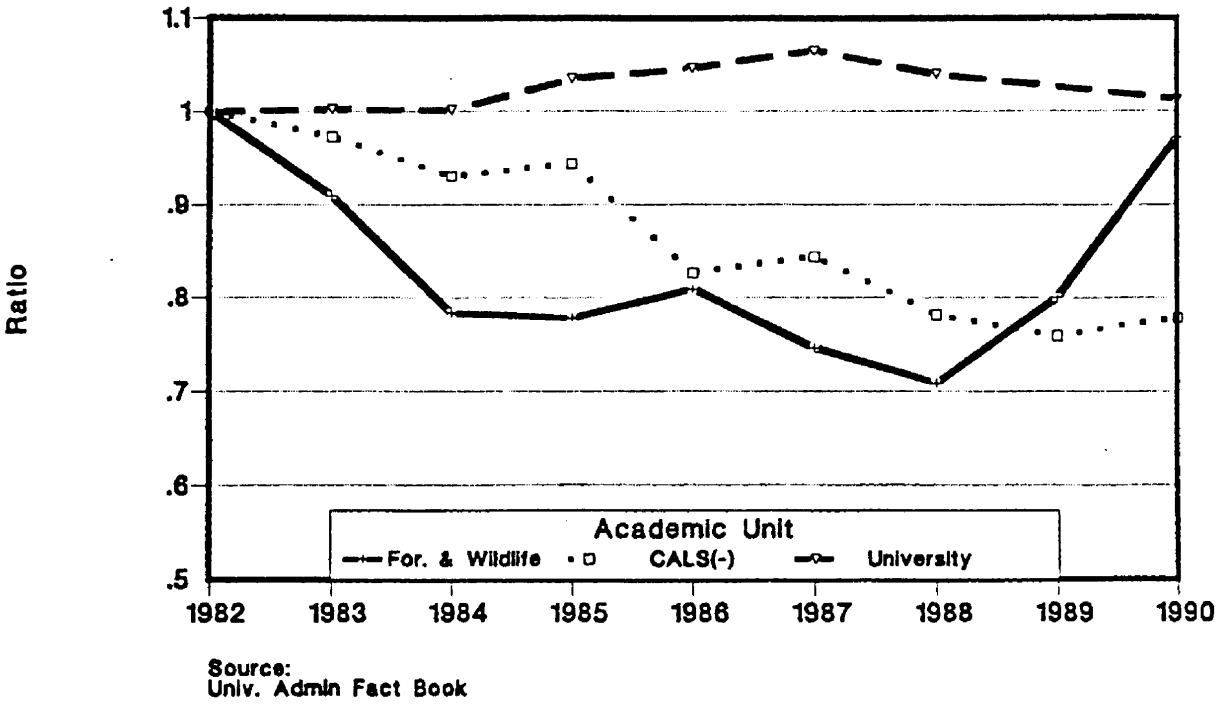


Figure 6. Number of Student Majors in Fall Term Relative to 1982 Levels.

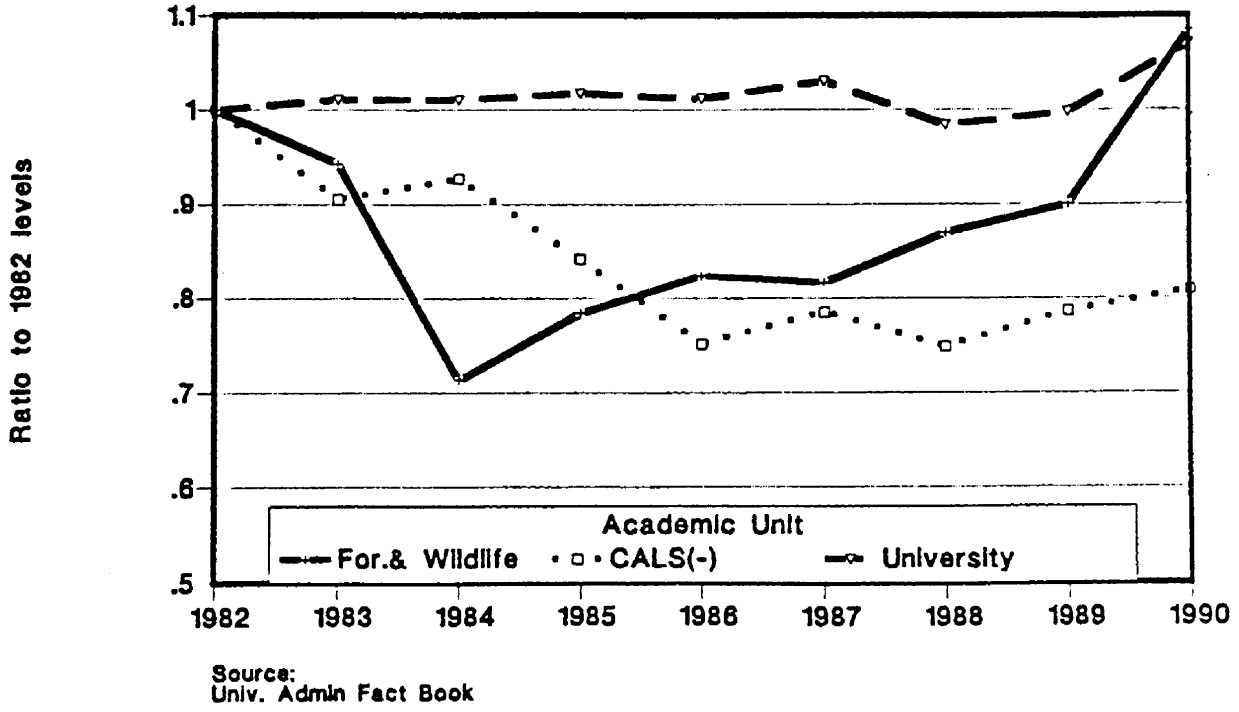


Figure 7. Fall Term Weighted Student Credit Hours Per Allocated 208 FTE Position Relative to 1982 Levels. (Instructional departments only.)

Graduate Placement

Bachelor of Science graduates of the proposed College will likely enjoy the same excellent employment opportunities as past graduates (Table 7). It must be recognized, however, that placement is often in part a function of the nation's economy and fluctuations in placement are to be expected in reviewing the past and in projecting the future. It is widely accepted that opportunities in natural resources will continue to improve.

Employment in renewable natural resources has traditionally been very strong in forestry, wood products manufacturing, and forest products marketing. In fisheries and wildlife, employment opportunities for B.S. students have traditionally been "soft" and comparable to those of biology majors. This is not perceived as a problem, however, as students in fisheries and wildlife often continue in graduate studies and are expected to do so if they are to be competitive for job opportunities. Also, many are pre-veterinary medicine students.

Graduate student employment opportunities are excellent; the School places virtually all its M.S. and Ph.D. graduates in professional positions, many are employed in the nation's most prestigious universities.

Table 7. Placement Profile 1986-1990 for Graduates of the School of Forestry and Wildlife Resources. (Source: School Surveys)

Year	Degree	# Students	Further Education	Professional Employment	Other	Unknown
1986	BS	47	9	22	3	13
	MS	18	1	11	0	6
	PhD	10	0	8	2	0
1987	BS	74	16	43	8	7
	MS	43	8	32	1	2
	PhD	6	0	4	1	1
1988	BS	73	15	36	6	16
	MS	25	6	15	0	4
	PhD	2	0	1	0	1
1989	BS	59	9	32	2	16
	MS	32	5	23	1	3
	PhD	10	0	8	0	2
1990	BS	59	10	26	5	18
	MS	30	8	17	2	3
	PhD	17	0	14	1	2

Graduates have been employed by a broad sector of public, private, industrial, and non-profit agencies and companies. The following is a partial list of the entry-level employers of School graduates:

Government Agencies

Alabama Surface Mining Commission
Bagmati Watershed Project, Nepal
Bureau of Land Management
Bureau of Reclamation, USDI
Federal Paper Commission
Florida Division of Forestry
Florida Game and Freshwater Fish Commission
Illinois Natural History Survey
Maine Department of Inland Fisheries and Wildlife
Maryland Department of Natural Resources
Massachusetts Fish and Game
Montana Fish, Wildlife and Parks
New York Department of Environmental Conservation
North Carolina Wildlife Resources Commission
Ontario Ministry of Natural Resources
Oak Ridge National Laboratory
Pennsylvania Bureau of Forestry
Saasveld Forestry Research Center, South Africa
State Extension Agencies
State Forestry Agencies
State Parks and Recreation Agencies
Tennessee Valley Authority
The Tulalip Tribe, Fish Department
US Army Corps of Engineers
US Department of Commerce
US Fish and Wildlife Service
US Forest Service
US National Marine Fishery Service
US Park Service
USDA Soil Conservation Service
Vermont Fish and Game
Virginia Department of Forestry
Virginia Department of Game and Inland Fisheries
Virginia Natural Heritage Program
Virginia Soil and Water Conservation Service
West Virginia Department of Natural Resources
Wisconsin Department of Natural Resources

Industrial

Atlanta Hardwoods Inc.
Australian Forest Holdings, Ltd.
Buckeye Cellulose Corporation
Carolina Power and Light Company
Champion International
Chesapeake Corporation
Coastal Lumber Co.
Container Association of America
Continental Forest Investments, Inc.
Crown Zellerbach Corporation
Dow-Elanco Company
Eastman Kodak
Georgia-Pacific Corporation
Hammermill Paper Company
Hercules, Incorporated
Hudson Pulp and Paper Corporation
International Paper Company
ITT Rayonier, Incorporated
John Deere
MacMillan Bloedel Ltd.
Mann and Parker
Masonite, Inc.
Mead Corporation
Merillat Industries
Potlatch Corp.
Stone Container Corporation
Union Camp Corporation
Westvaco Corporation
Weyerhaeuser Company

University

Auburn University
Clemson University
Cornell University
Duke University
Louisiana State University
North Carolina State University
Michigan State University
Michigan Technological University
Mississippi State University
Oklahoma State University
Oregon State University
Pennsylvania State University
Purdue University
Rutgers University
Southern Illinois University
Tehran University
Texas A & M University
Texas Tech
Tribhuvan University Nepal
University of Arizona
University of Arkansas
University of British Columbia
University of California, Berkeley
University of Florida
University of Georgia
University of Idaho
University of Maine
University of Maryland
University of Melbourne, Australia
University of Minnesota
University of New Brunswick, Canada
University of North Carolina, Charlotte
University of Ontario
University of Tennessee
University of Washington
University of Wisconsin-Stevens Point
Utah State
West Virginia University
Washington State University
Whittier College
Virginia Tech

Other

Audubon Society
Boy Scouts of America
Data Resources, Inc.
Humane Society
Ichthyological Associates
International Science and Technology, Inc.
National Wildlife Federation
National Particleboard Association
South Carolina Waterfowl Association
Southern Pine Inspection Bureau
Southern Forest Products Association

Programs Offered

One undergraduate degree program is offered by the School, the B.S. in Forestry and Wildlife Resources. Under this program there are ten programs of study in the School's three departments. All programs of study have a "common" freshman year, allowing students to become familiar with their options before having to make a career choice. Within each department, the following programs of study are available:

Department of Forestry

Five programs of study provide educational courses in the various aspects of production, maintenance, and utilization of forests for their commercial and social values. These programs are:

Forest Resource Management emphasizes the biological and economic considerations necessary for making sound management decisions concerning multiple uses and renewable resources of forest lands.

Industrial Forestry Operations is designed for students interested in working with private industry in the broad area of wood fiber acquisition for the forest products industries.

Forestry Business meets the educational needs for those students who wish to prepare themselves to manage forestry businesses and organizations.

Environmental Conservation is a program designed to provide a broad environmental education. It is directed towards students interested in graduate study in forestry and related areas and prepares students for employment in various conservation agencies.

Outdoor Recreation offers a program that balances study in the natural sciences and the social sciences with special course work in resource-based outdoor recreation.

Department of Fisheries and Wildlife

The program in *Fisheries Science* emphasizes recreational fisheries, endangered species management, and aquaculture. In one of the nation's largest programs of its type, students prepare for positions as fisheries managers, researchers, aquaculturists, and fisheries consultants.

The wildlife programs are comprehensive, covering all aspects of wildlife science and management. Two programs are available: *Wildlife Management* and *Wildlife Management/Pre-Veterinary Medicine*. The latter provides a complete wildlife management education supplemented with courses required for admission to veterinary school. The Wildlife Management option provides the education needed for employment in both public and private sectors; preparation for graduate studies is a central programmatic consideration as most job opportunities are for students possessing advanced degrees.

Department of Wood Science and Forest Products

The Department of Wood Science and Forest Products offers options in areas related to the forest products and wood-based industries. Two programs of study are available to undergraduates: *Wood Products Manufacturing* and *Forest Products Marketing and Management*.

Wood Products Manufacturing concentrates on the technical and engineering aspects of converting wood into finished industrial and consumer products.

The *Forest Products Marketing and Management* option prepares students for technical and managerial positions in sales, marketing, and distribution of forest products. This program is one of the most comprehensive of its type in the nation.

Degrees

The proposed College will offer a single B.S. degree in Forestry and Wildlife Resources; this represents no change from the current degree offerings of the School of Forestry and Wildlife Resources.

The following graduate degrees will be offered: M.F., M.S., and Ph.D. in Forestry and Forest Products; M.S. and Ph.D. in Fisheries and Wildlife. These degree offerings represent no change from the current degree offerings in the School of Forestry and Wildlife Resources.

New Academic Programs

While no new degree programs are planned for the proposed College, the College will likely consider the creation of a minor in renewable natural resources. This minor will be offered to students in allied programs such as biology, animal science, communications, education, landscape architecture, and urban affairs and planning. The minor would provide a basic understanding of natural resources for students intending to use their primary expertise in a renewable natural resource position.

Occupational Demand/Societal Need

Programs mentioned above are all being explored in response to emerging societal needs and employment opportunities. Specifics are not available at the present time.

SCHEV Guidelines

All degree programs in the proposed College currently meet or exceed SCHEV guidelines.

Historical and Current Research Trends

While trends in the School are best discussed at the departmental level, the noteworthy School-wide Center for Quantitative Studies serves as an example of how past strengths have been integrated to serve future needs. Extensive research by many faculty was occurring in computer-aided decision making, expert systems, geographic information systems, modeling of growth and yield, etc. Consequently, a School-wide Center for Quantitative Studies was created in 1987 to provide natural resources managers with new quantitative and computer-based decision-making tools. More specifically, research interests at the Center are directed at (1) developing methods to solve unstructured decision-making problems in more structured ways by means of computer assistance; (2) deriving more comprehensive and flexible inventory procedures and data structures; and (3) formulating computer-based information-processing systems and decision-support systems that integrate quantitative models and approaches with qualitative factors. The Center is an excellent example of interdisciplinary, cross-departmental research. Its director is from the Department of Forestry, and cooperating faculty come from the Departments of Computer Science, Fisheries and Wildlife Sciences, and Wood Science and Forest Products.

Other programs are described below by department.

Department of Forestry:

In 1959, forestry programs at Virginia Polytechnic Institute and State University were located in a newly created Department of Forestry and Wildlife. The department consisted of four teaching/research faculty (only one had a forestry specialty), four persons working in forestry extension, 69 undergraduates, and five master's candidates in wildlife management. For all practical purposes, there was no forestry research.

From those humble beginnings, forestry research and the associated graduate educational programs have grown until in the Fall of 1990 they involved 30 faculty, 57 graduate students, and over 120 individual projects. Expenditures in 1990 (federal fiscal year ending September 30) exceeded $2.3 million. Quality of research and graduate programs has increased continually along with size. Thus, the most recent (1985) reaccreditation review by the Society of American Foresters stated: "The vigorous forestry and forest products research programs at VPI & SU are widely known and have become models that many forestry schools are striving to match."

Quality is also reflected in the ability of the program to attract outside funding and in the ability of graduate students to find employment. In fiscal 1990 faculty generated $1.15 million in grants and contracts. The department's graduate students are highly sought for employment. Eighty-two Ph.D. students have been produced since the first one graduated in 1968, and they are represented on the faculties of 31 universities. A survey of accredited forestry schools completed in 1984 revealed that more assistant professors in forestry programs throughout the United States had received their highest degrees from Virginia Tech than from any other institution. Older, prestigious forestry programs at Yale, Syracuse, and Michigan have been supplanted by Virginia Tech as suppliers of the nation's new forestry faculty.

Early research efforts in the department obviously were dependent upon the expertise of the faculty hired, and that expertise was largely determined by the needs of the teaching program. A major thrust of the program in the early years was to obtain accreditation by the Society of American Foresters. Thus, research tended to occur in classical areas of forest management such as silviculture, forest economics, mensuration, etc.; and each research area tended to be implemented coincident with the hiring of a new faculty member. Also, each broad research area tended to be the focus of only one faculty member. Accreditation was achieved in 1965, and, subsequently, research programs were developed to address state, regional, and national needs.

Research initiatives in the department since the late 1960s have sought to take advantage of funding opportunities; they will certainly continue to do so. It was early recognized that cooperative ventures with industry and government agencies could be useful and efficient ways to promote graduate programs and to accomplish good research. Thus, the department is currently home for three research cooperatives. These organizations were created to focus expertise and resources at Virginia Tech, together with those from outside organizations, upon research of current forestry problems by graduate students and faculty. Students, working under the auspices of these cooperatives, benefit from interacting with scientists and professionals both within and outside the university. The programs are truly interdisciplinary. Also, the pooling of resources and talent within a cooperative fosters research programs that are larger and more sophisticated than individual organizations might care to support, and that address the most current issues and problems.

The Industrial Forestry Operations Cooperative, organized in 1974, conducts graduate research and provides technology transfer in timber harvesting, wood procurement, and forest engineering. Seventeen forest industry and logging equipment manufacturing firms have provided financial and operational support for a wide variety of applied research, including studies on shear damage to southern pine lumber, worker's compensation insurance for the logging industry, and site impacts from steep slope harvesting, to name just a few.

The Loblolly Pine Growth and Yield Research Cooperative was organized in 1979 to develop growth and yield estimates for intensively managed plantations. Numerous studies are currently underway, including efforts to interface growth and yield models with geographic information systems and incorporation of these methods in computer-based decision-support systems. Modeling technology developed in this cooperative is in use throughout the world; the loblolly pine models are used throughout the South wherever the species is grown. Members include 10 industrial firms and the Virginia Department of Forestry.

The newest research cooperative is a Cooperative Park Studies Unit (CPSU) with the U.S. National Park Service. The Mid-Atlantic Regional Scientist of the Park Service is Unit Leader and a member of the faculty. The CPSU researches ecological, sociological/psychological, and economic topics to provide information needed for management of our national parks. Our three research cooperatives are excellent examples of academia working in partnership with governmental agencies and industry to successfully solve real-world problems.

A second recent major research thrust has been in the areas of atmospheric deposition, pollution, and global climate change. Funding has come from the USDA Forest Service, the Environmental Protection Agency, Cooperative State Research Service Special Grants Program, National Council on Air and Stream Improvement, and others. This research, because of the nature of the problem, has been interdisciplinary (physiology, soils, ecology, genetics, economics) and has crossed departmental lines, especially involving the Department of Plant Pathology, Physiology, and Weed Science.

In fact, strong ties exist between the Department of Forestry and many others on campus, including Statistics, Computer Science, Industrial and Systems Engineering, Civil Engineering, Agricultural Economics, and others. Cooperative multidisciplinary endeavors are common and probably will increase in the future. Examples include strip mine reclamation, wilderness management, modeling of international and regional trade in forest products, and many others.

What does the future hold? Research programs will continue to grow in the areas of pollution effects and global change, and quantitative applications in natural resources management. Research to determine the efficacy and cost effectiveness of existing forest best management practices and to develop new ones will become a major thrust, as efforts to regulate, via legislation, forestry practices on both public and private land increase. Studies aimed at evaluating, protecting, and enhancing non-timber values obtained from forests, especially recreation, will increase. Cooperation with scientists in other departments as well as in various government agencies and in industry will occur more frequently, and interdisciplinary approaches will become more and more common. But much of the department's research always has been interdisciplinary and has involved outside cooperation since the beginning.

Department of Fisheries and Wildlife:

The Department of Fisheries and Wildlife Sciences has a comprehensive research program designed to cover most topics central to freshwater fisheries and wildlife management. The program is highly applied, emphasizing research to meet the needs of public resource management agencies and private organizations. The program began in cooperation with state and federal agencies, which recognized in the 1930s that their success in protecting and enhancing wild fish, bird, and mammal populations required a better scientific basis and a cadre of well educated professionals. Toward that end, the department has emphasized a balanced approach to research and scholarship, so that students would receive a broad education compatible with their future professional responsibilities and advancement opportunities.

From a single faculty member in 1935, the department has grown to one of the most prolific and respected in the nation. The department has retained a close alliance with public agencies, especially through two federal cooperatives. The U.S. Fish and Wildlife Service provides three faculty for the Virginia Cooperative Research Unit, and the USDA Forest Service provides two faculty for the Coldwater Stream Research Unit. These units supplement the expertise of the 13 university-paid faculty and are an essential part of all missions of the department.

The department's research program began with a traditional emphasis on the biological study of game fish and animals (that is, animals sought by hunters and anglers). Early departmental research fostered the restoration of the wild turkey in Virginia and throughout the United States. Current faculty have continued that emphasis, with research programs addressing all major game fish and animals in the state.

The department's reputation for comprehensive research is based on the expansion of research competence as the scope of fisheries and wildlife also expanded. The department houses a nationally prominent research program in wildlife nutrition, physiology, and toxicology, emphasizing the influence of habitat conditions on reproductive success. Faculty are leaders in research on rare and endangered species, especially freshwater molluscs and predatory birds. The department's strong program in habitat research, covering streams, rivers, forests, and farmland, is one of only a few active habitat programs in the nation. The department is well recognized for its programs in the non-biological aspects of fisheries and wildlife, including assessment of public values and uses of natural resources, evaluation of agency performance, and use of computers in resource management.

The success of the program is indicated by continually expanding contract and grant support. Annual extramural research funding reached $1.7 million in 1990 and generally sets new records each year. Between 1985 and 1990, for example, annual research grants increased by 70%. At least 60 scholarly projects are in progress at any time, funded by virtually all major federal and state agencies, many private conservation organizations, and private businesses with land and water management responsibilities. The broadening diversity of sponsors and the continually increasing financial base promise continuing success.

The department is also beginning to recast its programs in endangered species research into a broadened program focusing on the conservation of biological diversity. The emerging public interest in protecting species and entire ecosystems provides an opportunity to elevate this research interest into a university-wide interdisciplinary program involving departments in several colleges and departments. The department will host the 1992 meeting of the Society for Conservation Biology, as a first step in highlighting the program.

An overriding issue for the future is integrated land and water management--finding ways to address the complex and competing demands for a quality lifestyle with limited resources. The comprehensive nature of the department's research program is ideal to address this need. Along with colleagues in Forestry, Wood Science and Forest Products, and other units throughout the university, the faculty intend to develop true interdisciplinary programs covering research, teaching, and public service. This work will emphasize team building, decision-making, public administration, economic analysis, systems theory, and advanced computerized analysis. Faculty expertise, current physical resources, and connections with resource agencies and private groups virtually assure the success and high profile of this work.

The department is strongly committed to education, both inside and outside the traditional classroom. A new continuing education program, begun in 1989, now offers several two-week short courses each year to mid-career professionals in natural resource agencies. The current goal for that program is to offer a minimum of 12 weeks of continuing education each year. The society-wide interest in natural resources also suggests that educational efforts in public schools, local parks, zoos, and in the electronic media will expand greatly. Toward that end, the department is currently assessing the feasibility of a conservation education program, designed to educate educators, and funded initially by a major grant from a private foundation.

Several other initiatives in the formative stages are research initiatives in: (1) captive animal management; (2) vertebrate pest control; (3) wetland management; and (4) environmental impact analysis.

Wood Science and Forest Products:

Wood science and forest products research was started at Virginia Tech in 1963. During the first five years, there were two faculty members and an average of one technician and five graduate students involved in wood related research and scientific studies. In those early days, the emphasis was placed on basic research related to structure-property relationships for wood and wood products and on heat and mass transfer in wood under conditions of kiln drying. During the late sixties and early seventies the wood science program was expanded by the addition of faculty and staff and through attracting outside support for research and outreach programs. The result of that expansion was a more balanced research effort including not only the basic wood sciences but also more applied technological developments important for the industry.

Over the more than a quarter century history of wood science associated with the forestry and wildlife program at Virginia Tech, research has undergone several shifts between the basic and applied areas. Those shifts were the results of direct responses to societal and industrial demands and the associated sources of funding. The flexibility of the program allowed it to grow, and in 1979 it became a separate department within the School of Forestry and Wildlife Resources. In 1987 the Department of Wood Science and Forest Products was ranked by an independent national survey as the No. 1 program in the country. In 1988 it was designated by the State Council of Higher Education as one of the initial seven Commonwealth Centers of Excellence at state-supported colleges and universities. In 1990, extramural research funding reached $3.18 million of which 1/3 was from industry sources.

Recently, several other centers, cooperatives, and programs have been initiated by the faculty, capitalizing on research needs and opportunities. The Biobased Materials Technology Development Center was organized in 1988/89 as a response to public and industry concerns regarding the utilization of wood residues and agricultural waste. That Center is supported by the Center for Innovative Technology of Virginia (CIT) and over 30 industrial concerns at approximately $1.0 million per year. The Wood Composites Center was founded in 1990 with 15

industrial sponsors and partial support by CIT. That Center has its major objective of developing wood fiber based composite materials. The Consortium on Process Automation, started in 1989, is an interdisciplinary research group developing computer vision systems for lumber and automated cut-up schemes based on the vision data. That effort is supported by the U.S. Forest Service and industrial partners.

The wood science and forest products research program will continue its involvement with the problems of the last decade of the 20th century and beyond. In an era of heightened awareness of environmental issues, the forest products industry has an unprecedented challenge. The new direction the program at Virginia Tech will take is in the general area of conservation of natural resources. Thus research will focus on recycling issues, on more complete utilization of the shrinking availability of forest resources for industrial uses, and the marketing and management problems associated with these issues. The wood science and forest products program will continue to be the leader as well as the provider of scientific knowledge in the general area of the environment, society, and the use of wood.

In the above context, opportunities exist for the wood science program. One such opportunity is in research and development for the conversion of wood waste and industrial wood residues to high-value products through chemical and biochemical conversion such as polymers, plastics and various solvents and liquid fuels. Also recycling of wood-based municipal solid waste such as paper and other fiber products will present further research opportunities. Through those efforts the department will contribute to the conservation of forest resources.

In wood engineering the objective will be to develop design methods for more efficient use of wood-based materials in structures. The development of new structural wood-based composite products will also be included in the research program. In these efforts, the strong interdisciplinary programs in materials, civil engineering, and agricultural engineering at Virginia Tech, will help achieve success.

Manufacturing processes in the wood industry are, in general, quite inefficient in raw material utilization. In some processes less than 50% of each log is converted into high-value products. Process control and automation will be studied and developed and will include computer vision systems to locate defects in logs, lumber and veneer products. With such systems, yield from the raw material resource can be significantly improved.

Forest products marketing, both domestic and international, is an area that will benefit industry and the nation. As new wood-based products are developed, markets must be developed for them. The wood science and forest products department already has a strong foundation in this area. Further expansion in forest products marketing will be a good investment for the future.

Trends in Public Service

Virginia Tech's extension program in Forestry began in 1925 with the employment of the first extension forester. The program remained small, serving only a limited clientele over the following 25 years. The environmental movement in the 1960's raised public awareness. The rising environmental awareness was accompanied by increasing demands for the products and amenities associated with natural resources. The extension programs in forestry were slowly expanded to include forest products. During the 1960's and 1970's, extension specialists in fisheries and in wildlife were added. However, new demands brought on by rapidly changing social and economic values were never addressed, and extension programs served only limited

audiences. Inadequate resources, both in personnel and funding, kept the School's extension and public service programs from reaching its full potential.

Public interest and support for forestry and natural resource programs is accelerating. A concern over the need for economic development in rural areas and the wise stewardship of our natural resources is being raised at all levels of government and society. In Virginia, the Governor's Strategic Plan for Rural Development and House Resolution Number 42, Report of the Commission to Prepare Recommendations to Improve and Enhance the Economic Development of the Southside Region of the Commonwealth, both contain strong recommendations for the improvement and enhancement of forest resources, aquaculture, and recreation to promote economic development. At the national level, new initiatives are being funded in Forest Stewardship, America the Beautiful, and Environmental Education. A separate Forestry title was included in the 1990 Farm Bill. Public support for forestry and natural resources is growing and is likely to continue to grow in the future.

It is clear that demands for forestry and natural resource extension and public service programs are growing faster than the present School's ability to respond to them. Currently, the extension and public service programs in the School of Forestry and Wildlife Resources include 9.3 faculty positions and 1.5 classified positions. Local extension units have never been staffed by forestry and/or natural resource agents, even though two thirds of Virginia land areas are forested and the annual value of forest resources exceeds $5.2 billion. Whereas the Federal Extension Service established a separate natural resource and rural development program area, natural resource programs in Virginia have remained under an Assistant Director for Agriculture and Natural Resources. An Extension Project Leader provides the leadership for the School's Extension Programs.

The School of Forestry and Wildlife Resources has responded to the need to develop new programs in public service. The Department of Fisheries and Wildlife Sciences offers 6 weeks of graduate level short courses for professional natural resource managers. The School has a coordinator of continuing education to promote public service activities. The School's long-range plan closely parallels those in the University Plan to enhance the quality of the university's programs of public service, continuing education and cooperative extension.

Extension and public service activities must be expanded to target new audiences in forestry and natural resources. This is a critical time for the university to demonstrate the ability to restructure extension and public service activities to meet the needs of the Commonwealth.

VIII. PROPOSED EVALUATION CRITERIA

Evaluation of the effectiveness of the proposed College will be based on achievement of goals and objectives contained in the "Agenda for the Future 1990-2000" and the University Plan. As explained earlier, the proposed College will continue to be dedicated to a continuous process of improvement by several well-established mechanisms.

It is proposed that after five years, the College will conduct a self-study, modelled after the recent university self-study and designed to address the College and university goals as previously defined. The College will also participate in the normal internal evaluation process which will be complemented by a U.S.D.A. Cooperative State Research Service review. This complementary review will be conducted by a team of peers from nationally ranked institutions.

The existing School of Forestry and Wildlife Resources has been largely responsible for its own evaluation throughout its history. To that end it has established annual and periodic evaluation programs. Thus, the evaluation approach proposed for the new College is not experimental but, rather, is based on decades of experience.

IX. TRANSITION

Transition to collegiate status will require action teams to deal with a multitude of necessary changes and details. There are at least two key groups that will be needed for the transitional period of January 1, 1992 to June 30, 1993.

Resources Transition Team

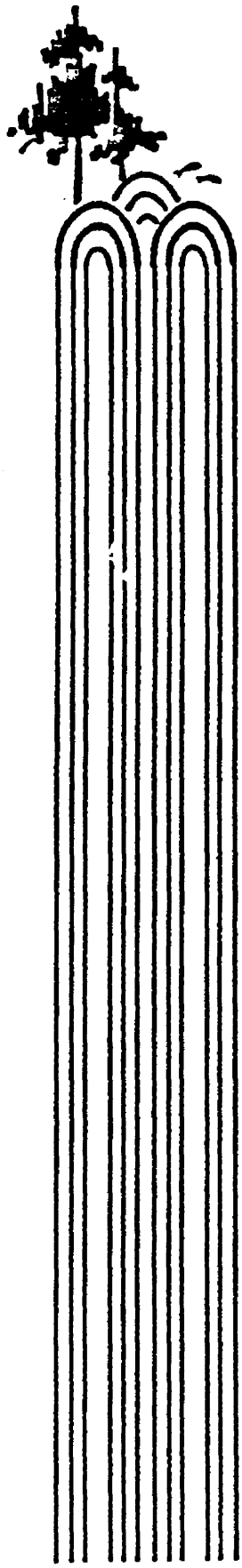
Members of this team will be drawn from the School of Forestry and Wildlife Resources, the College of Agriculture and Life Sciences, and appropriate administrative support departments. The chair of the team should be from the Provost's Office. The purpose of the team is to fairly and equitably identify the personnel, space, and fiscal resources that should be allocated to the new College.

Internal Administration Team

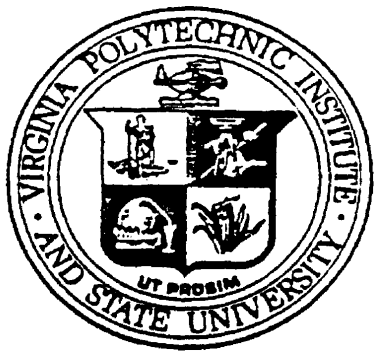
This team will be comprised of faculty and classified staff from SFWR and elsewhere as appropriate. The purpose of this team is to address the myriad of actions that will be needed to internally adjust to collegiate status. Examples include the formation of faculty and staff associations, integration into the faculty governance system, liaison with administrative and other groups on and off campus, and assist in the search for College staff. Many of the functions of this team, once in place, will be maintained by the new administrative structure and existing faculty committees.

ADDENDUM A

An Agenda for the Future 1990-2000



AN AGENDA FOR THE FUTURE 1990 - 2000



SCHOOL OF FORESTRY AND WILDLIFE RESOURCES

COLLEGE OF AGRICULTURE AND LIFE SCIENCES

JANUARY, 1990

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SCHOOL OF FORESTRY AND WILDLIFE RESOURCES

Mission Overview

The missions of the School of Forestry and Wildlife Resources focus on the long-term development, management, and utilization of renewable natural resources and are:

a. to educate students to be knowledgeable and responsible professionals,

b. to seek, evaluate, communicate, and preserve knowledge, and

c. to assist private and corporate citizens of the Commonwealth, the region, and beyond in resolving common problems and nurturing opportunities.

Introduction

All academic units in a land grant university, including the School of Forestry and Wildlife Resources, can be described by their contributions to the global missions of **education, research, and public assistance.** These are clearly evident in the School mission statement. However, like all academia, the School is fundamentally a service organization, and a succinct mission statement may not be the best insight into its responsibilities. To understand the School's goals and direction, it is necessary to know its constituencies--who is served and how.

A principal constituent is the *student* – defined in the broadest sense. A major role is to educate undergraduate and graduate students to be knowledgeable, professional and responsible; to provide a base from which many diverse careers may grow. The School also serves the continuing education needs of its representative professions and the public. The educational focus is on development, management, and utilization of forest and water-based resources. While the common link is the resource, faculty interests and expertise range from forestry to aquaculture, from biometrics to biochemistry, from marketing to manufacturing, from recreation to resource planning.

The *research* constituency of the School is the world and its citizens. Some efforts serve corporate and societal clients with short and intermediate term, very focused, high impact knowledge development. Others serve the professions and sciences with building blocks to a better understanding. Research and education – of both researchers and students – go hand in hand. They cannot be and are not separated. The School serves five distinct but not separate professions:

- **Fisheries** — the management of living aquatic resources and the culture of aquatic organisms
- **Forestry** — the management and use of resources on and in association with forest lands
- **Outdoor Recreation** — the management of natural resources for the provision of leisure-pursuit and other non-commodity benefits
- **Wildlife** — the management of a broad range of wild animals, from large game to endangered invertebrates
- **Wood Science & Technology** — the materials science and utilization component of the forest products industry.

Faculty and students serve these professions as active participants by constantly challenging their scope.

The School, as part of a major university, is able to implement comprehensive, interdisciplinary rather than narrowly-focused, solutions. School faculty participate in all three University missions. Often the solution to a problem is already at hand. Delivering that solution to the user serves a third constituency -- the *private* and *corporate* citizens of the Commonwealth, the region, and beyond. This group is very diverse, with often conflicting needs and includes not only direct beneficiaries such as forest industry but also the entrepeneurs and employees which depend indirectly on the management of natural resources. School faculty provide the information, education and technical assistance through short courses, workshops, professional training sessions, and literature that clientele need to make informed and responsible decisions. The School also serves to nurture opportunities for improved or expanded utilization of natural resources through workshops and technical consultation, problem identification and resolution, and economic development assistance.

The Past

Virginia Tech's teaching, research, and outreach contributions to Forestry and Renewable Resource interests in Virginia, the region, and beyond began in 1925 with employment of the first extension forester. Forestry instruction and research began in 1936 within the Biology Department of the College of Agriculture. A Department of Forestry was formed in 1959, with 7 faculty, 5 graduate students and 66 undergraduates. The School has since grown to its current strength of 66 faculty plus supporting technical, clerical, and secretarial support, 140 graduate students and 350 undergraduates. The programs of the School of Forestry and Wildlife Resources evolved as follows:

1925 First Extension Forester Employed
1935 Cooperative Wildlife Research Unit Established
1936 Teaching and Research Initiated in Biology Department
1959 Department of Forestry and Wildlife Established
1964 Cooperative Fisheries Research Unit Established
1969 Department Becarre a Division of the College of Agriculture and Life Sciences
1972 Department of Forestry and Forest Products and Department of Fisheries and Wildlife Established
1976 School of Forestry and Wildlife Resources Established
1979 Department of Wood Science and Forest Products Established

Since 1959, the School and its precursors provided effective and strong leadership, and actively pursued excellence in all three missions of its land grant responsibilities. Growth in faculty numbers and prestige, achievements of undergraduate and graduate alumni, and success in attracting research funding have enabled the School to achieve an enviable position among peer institutions. All three departments currently rank in the top 5 in the nation by peer review. Present levels of School programming have been achieved both through planned development and opportunistic moves as resources became available for new programs.

School growth benefitted greatly from the rapid development of the University and the College of Agriculture and Life Sciences during the 1970s and early 1980s, and from the commitment of the Commonwealth to quality education and service. Overall, University and College priorities have been supportive of growth within the School, although at times their priorities have restrained the growth envisioned by external constituencies and supporters.

Trends in total student enrollment have paralleled those of forestry schools throughout the United States, rising to a peak in the period 1975-1980 and falling rapidly in the mid-1980s to a plateau, where they have remained during the last six years.

These enrollment trends can be attributed to attractiveness of careers in natural resources and to demographic and economic factors. Rapid expansion in industrial production to meet pent-up consumer demands following World War II stimulated a need for increased numbers of natural resource managers in the 1950s and 1960s. Public interest and participation in natural resource policy following publication of Rachel Carson's "Silent Spring," Earth Day in 1970, the Vietnam Era and its impact and controversy on pesticide use, and the entire environmental movement brought increased student numbers into natural resource curricula. Student numbers in forestry schools increased dramatically through the 1970s and early 1980s. Tightened corporate and public sector budgets in the mid-1980s led to decreased demand for natural resource managers. Employment opportunities and student numbers declined in traditional natural resources areas. Demand for forest products and marketing graduates remained strong as students saw opportunities in business and production fields. That era, in general, saw entering college students seeking areas of education and employment offering better perceived job prospects and higher financial returns.

An increased demand for natural resource and related personnel is now evolving, stimulated by a strong economy, public perception of the need to better husband the renewable natural resource base, and a growing concern for environmental quality. Also, personnel turnover of post-World War II foresters and resource managers has opened new opportunities. In fact, the enrollment trend in the School has reversed with rising numbers for the last three years. This past year (1989) the School's undergraduate enrollment increased by twenty-five percent over the previous year.

The Present

The University is strategically situated in the heart of the eastern United States. It has access to the largest hardwood resource in North America and the well-developed and economically strong southern pine industry. It is ideally located between major centers of consumer demand and an extensive regional resource and manufacturing base. There is a full range of terrestrial and aquatic ecosystems which are distributed across five major physiographic provinces and include an array of habitats from northern boreal forest types to Atlantic Coast tidal estuaries. Major East Coast population centers place strong demands on all facets of renewable natural resources and can provide unique opportunities to gain new knowledge about the interactions between humans and their environment. The close proximity to centers of state and national governments and associated agencies provides an atmosphere for liaison, cooperation, and impact. In addition, the University lies along major transportation corridors that provide ready access to local, national, and international markets.

The breadth, depth, and balance of the faculty provide the core of strength within the School. The 66-member faculty, with doctoral degrees from 30 major U.S. and 4 foreign universities, brings a wealth of knowledge and experience from many parts of the world. The faculty has a mix of youth, maturity, academic rank and age, and possesses a

high level of spirit, individuality, competitiveness, energy, and humor. Yet constant dialogue occurs, and an atmosphere of cooperativeness prevails. The size of the faculty allows for comprehensive coverage of the management and use of renewable natural resources. Each of the School's five major professional areas is represented by four or more faculty members.

The 350-member undergraduate body is composed of students whose average high school rank is the upper 15th percentile of their high school graduating class. Seventy-five percent of the students come from Virginia, and a significant number of out-of-state students come from Maryland, New Jersey, and Ohio. A strong academic and professional education from Virginia Tech provides these students with excellent career opportunities in agencies and businesses nationwide.

The 140 graduate students have been carefully screened and selected from applicants from major universities worldwide. The graduate student body is composed of 40 percent Ph.D. students and 60 percent M.S. students. The majority of the graduate students is supported by stipends provided by faculty-obtained grants and contracts, federal and state appropriated funds, and private endowments and gifts.

Program strength within the School is greatly enhanced by the strong academic programs in numerous other colleges and departments of the University. The most important supporting units include Agricultural, Civil, and Chemical Engineering; Agricultural Economics; Biology; Computer Science; Crop and Soil Sciences; Entomology; Environmental Sciences; Management; Marketing; Public Administration; Sociology; and Statistics. In addition, the School has the computer and library resources associated with a major comprehensive university.

The School is housed in two primary facilities, Julian N. Cheatham Hall and the Thomas M. Brooks Forest Products Center. In addition, there is a small amount of office space in the Litton Reaves Building. Off-campus facilities include the Center Woods aquaculture and wildlife facility adjacent to the campus, the Fishburn School Forest outside Blacksburg, and the Reynolds Homestead Agriculture Experiment Station located in Patrick County, Virginia. At one time, these facilities and associated laboratories and equipment provided adequate teaching and research space; however, evolution and growth of the School's programs have created a severe space deficit.

Unlike the majority of its peer organizations, the School of Forestry and Wildlife Resources is not an administratively separate unit. The School Director reports to the Dean of the College of Agriculture and Life Sciences despite the School's size and lack of ties to traditional agricultural programs.

The School has developed as a cohesive unit of different disciplines spread across the three departments. The interrelationships and mutual support between these departments are a hallmark of the School. Thus, this plan was prepared as an agenda for the School as the focal academic unit.

The Future

The future is unknown and unknowable. Nevertheless, anticipating the future is the critical step in designing goals and strategies for excellence. Presented with the task of describing the future, each faculty member would undoubtedly develop a unique picture dependent on his/her individual experience and interests. To arrive at a more common vision, however, the School imagined the future through two nominal-group workshops. In June 1988, a cross-sectional group of 16 faculty produced a list of 13 major trends. In December 1988, a group of 19 outside experts, representing government, industry, and the five professions, reviewed the 13 major trends and generated their own list of 14 significant trends. These two analyses have been combined and further evaluated by the Long-Range Planning Committee to develop a list of trends most likely to impact natural resources professions over the next decade.

Increasing Environmental Consciousness

The environmental awareness and concern of Americans, demonstrated consistently in recent decades, will continue. Public concern about human health will increase as knowledge increases and the environmentally-concerned population ages. Broad concerns about the maintenance of a sustainable planet will become much more prevalent. Consequently, natural resource professionals will need to become more conscious of the long-term effects that their actions and recommendations have on both natural and cultural environments, and better at communicating with non-professionals.

Greater Diversity of Natural Resource Products and Uses

As Americans continue their search for a higher quality of life, they will look increasingly to natural resources as a source of desired products and services. Simultaneously, demographic changes will generate demands for different products and services. Needs for traditional natural resource products (sawtimber, pulp wood, hunting, fishing) will continue, but demands for different and more specialized products (wood composites, biochemicals, special fibers, accessible recreation, wilderness, ecological preserves) will intensify. Private landowners will need to supply an increasing proportion of all types of natural-resource-based services and products.

Intensification of Land Use

A growing population, with expanding interest in the environment and natural resources, will require increasingly planned and intense use of land and water. Except for areas specifically protected from human development (e.g., wilderness areas, parks, and preserves), most lands and waters will become actively managed. The intervention of humans will become more obvious globally, but less obvious locally, as management skills increase. Conflicts among land-use interests will increase, particularly along the rural/urban interface.

Increasing Regulation of Private Lands

The definition of "private ownership" for land, forest, and water resources will be challenged continuously in coming decades. The general public will seek to narrow landowner freedom to modify land and to broaden landowner responsibility to neighbors and future citizens. Governmental subsidies, in terms of cash payments, tax incentives, public services, and others, will be more closely tied to regulatory compliance. Landowners will resist such changes and will demand greater compensation for short-term losses in profitability caused by government restrictions.

Increasing Influence of State and Local Governments

Following national trends toward stronger and more participatory local governments, Americans will exert strong influence on natural resource management through direct participation and through local and state governments. The resulting enthusiasm and local ability for action will create special opportunities for enhanced natural resource productivity. But local interest will also demand more accountability and decentralized decision-making. Natural resource agencies and businesses, therefore, will operate in an increasingly uncertain management environment and will need to be more responsive to multiple points of interest and power.

An Increasingly Information-Rich Society

The continuing "information revolution" will constantly enrich the information resources available to every American. Americans will know more about the natural world and natural resource management than any previous citizenry. The speed of information delivery, however, will make the public less patient with the slower pace of natural resource decisions and results. Simultaneously, the crush of information will make people less capable of recognizing important information and less interested in all information. Natural resource industries and agencies will need to invest heavily in the management of information, both for internal operations and for public communication.

Increasing Importance of the World Economy and Community

The trend towards partnership rather than dominance in world affairs will continue, with more balanced distribution of economic and political power among nations. Partnerships between domestic and foreign natural resource companies and agencies will become more prevalent. Domestic natural resource businesses will become more integrated and less commodity-oriented. Businesses will emphasize the added value of more highly processed and engineered products and the export of expert knowledge. Natural resource agencies will increase their participation in global resource management, recognizing the need for worldwide cooperation.

In sum, American concern for "quality of life" will place great demands on natural resource management in coming decades. Our citizens will expect more diverse and higher quality benefits and products, produced with more sensitivity to long-term environmental consequences. The public will seek more control over the decisions of governments and of private landowners. Natural resource professionals must respond by becoming more technically skilled, culturally sensitive, and internationally oriented.

Goals and Strategies

This plan sets an operations agenda for the next decade. Goals and strategies for meeting the goals were developed by assessing where the School has been, where it is currently, and where it needs to go in the future.

The School mission statement served as a basis for developing the following goals:

1. To educate high quality professionals who can function effectively in entry-level positions and assume positions of ever-increasing responsibility throughout their careers.

2. To provide graduate programs that combine (a) a high quality faculty, (b) a student body selected from the best undergraduate degree recipients in this country and abroad, (c) and courses offering the most advanced knowledge in order to produce outstanding researchers, educators, and practitioners.

3. To strive for excellence in research through the use and exploration of appropriate scientific concepts and applications for the benefit of society.

4. To integrate the School's research program with the teaching program, especially at the graduate level, and with the extension program.

5. To provide students not enrolled in the School's majors degree with an understanding of renewable natural resources so they can assume leadership roles and foster a rational conservation ethic within the general public.

6. To effectively disseminate knowledge and to provide a new program of public service to the School's constituencies which will enhance the benefits, goods, and services obtained from natural resources of the state and surrounding region.

The predicted future trends were used in a general way to define the types of strategies which should be pursued to attain these goals. The future trends, however, should serve primarily as guides for the elaboration of more specific tactics which must yet be defined for each of the strategies. This is a necessary second stage of the planning process which must occur in the future. Therefore, the following pages present some important directions for the School through the 1990s and are the substance of this plan.

Goal #1: To educate high quality professionals who can function effectively in entry-level positions and assume positions of ever-increasing responsibilities throughout their careers.

Strategies

a. **Evaluate the content, structure and continuity of current curricula relative to the skills needed within the different professions represented in the School.**

Graduate and undergraduate curricula are the major tools that we use to develop our principal product--students. The curricula affect student and faculty recruitment, department identity, financial resources, student and faculty time commitments, employability of students, and the perception of our programs by peers and constituencies. It is in our best interest to evaluate critically what basic educational requirements our graduates, their employers, and society require. Outcome assessments are one such method of evaluation. How best can we meet those requirements given our inherent constraints? Are we protecting curricula at the expense of coherence and responsibility to the student and our constituencies? We need to provide the "basics" so that they may build their professional careers on a continuing learning process. Special consideration should be given to the continuity and sequence of information presented to the student by the whole curriculum.

b. **Evaluate programs both in terms of student perceptions of their education and training, and in terms of the employers' expectations.**

One of the purposes of education is to provide the student with knowledge and the ability to solve problems in society, and more specifically, in a particular job. An entering student's perception of a particular profession is quite often very different from reality. Specific employers within the same profession also have different expectations. There needs to be a consensus, between the employers and the faculty of professional educational and training requirements for each degree level and option. These requirements must be evaluated periodically, updated, and clearly transmitted to students during the early stages of their college education.

c. **Charge each professional group within the School to draw a list of specific competencies they expect should be part of future curricular considerations.**

Higher education accountability is mandated by law. In order to evaluate effectively professional competence in a specific area, it is necessary to first establish the concepts, issues, facts, policies, and other knowledge items that are necessary for a specific professional level. Consideration also must be given to a

balance between entry level knowledge and knowledge required for optimum continued learning and professional advancement.

d. Reevaluate strategies for increasing writing and computer skills.

The School has been a leader among natural resource academic programs in developing writing skills and implementing computer-based tools in the curriculum. These programs have matured, and it is time to examine whether they, and the standards they promote, are meeting our and the students' needs and expectations. If we are to retain a leadership role in this area, we need a clear understanding and annunciation of objectives and a plan to develop the needed resources.

e. Determine optimal enrollment levels for maximum efficiency in instruction and matriculation relative to changing curricula.

Efficient use of time is a key factor in maximizing productivity. Most faculty have appointment splits. Teaching is only part of their overall responsibility. Various class types (lectures, indoor laboratories, field laboratories, and recitations) have maximum sizes above which educational effectiveness is severely reduced. It is highly desirable to stay well above the minimum class size and just below the point where a class or laboratory must be split into two sections. Overall coordination at the School level would be one factor to be used in targeting recruiting efforts and direction. This will ensure most efficient use of faculty time.

f. Increase enrollment in those professional programs where growth is projected and routinely evaluate all existing programs for applicability and relevance.

Undergraduate options within the School have been created and abandoned through time as the needs of students and society have changed. Given the rapid pace of change anticipated over the next 15 years, we should objectively review current curricula to determine which should be eliminated or greatly altered. We also should consider adding new options or strengthening existing options which promise growth in the future. Options in urban forestry, natural-area management, furniture manufacturing, animal damage control, and international forestry deserve close scrutiny.

g. Change the image projected by the professional programs in the School so that student and public perceptions of career activities match reality.

Students and the general public have historically viewed natural resource careers as field jobs, utilizing and requiring a low level of technical and social skills. This view is an inaccurate picture of current careers and will become

increasingly inaccurate in the future. To some degree, our professional organizations have fostered this widening gap between perception and reality. This gap will continue to have a major impact on recruiting high quality undergraduate and graduate students from diverse backgrounds and with diverse aspirations. Improving the image of our various professions and dispelling misconceptions about career opportunities are vital to enable students to make informed, realistic educational and career decisions. This image is also quite critical to the future success of the School.

h. Provide special "In Honors" programs for the distinctly superior students enrolled in the School's curricula.

As the School gains prestige on and off campus, the curriculum attracts an increasingly larger number of distinctly superior undergraduate students. It is the responsibility of the School to provide the appropriate intellectual challenges for these students. Consequently, the School, in conjunction with the College and the University, will develop an In-Honors program with appropriate incentives for both students and faculty.

Goal #2: To provide graduate programs that combine a high quality faculty, a student body selected from the best undergraduate degree recipients in this country and abroad, and courses offering the most advanced knowledge in order to produce outstanding researchers, educators, and practitioners.

Strategies

a. **Recruit and retain faculty who excel in teaching and research by offering salary and appointment incentives.**

The School has matured in the last decade in terms of faculty age and experience. At the same time, it has grown with the addition of many new faculty positions. Therefore, to maintain superior quality in teaching and research, it is important that senior faculty remain stimulated and that excellent young faculty be recruited. Incentives should be offered to senior faculty through the establishment of additional endowed chairs or special ranks/titles and additional salary adjustments. These incentives should be coupled with mandatory, periodic performance reviews. Flexibility is needed, also, in making research/teaching appointment splits for both junior and senior faculty.

b. **Develop programs for broader involvement of high quality international students in graduate and research programs.**

A reasonable balance between enrollments of international and U.S. students should be kept for the sake of their mutual benefit, especially in terms of cross-cultural influences. It is also important to develop a diversity in the countries from which the international students are drawn. Greater effort should be made to increase the relatively low number of applicants from Britain, countries in Western Europe, Australia, and New Zealand. Appropriate literature aimed at specific foreign student populations might be effective in recruitment efforts. Also, cooperative research programs should be encouraged with universities where desirable students are located.

c. **Encourage methods to achieve a better balance of basic and applied sciences program requirements for graduate students.**

All programs in the School of Forestry and Wildlife Resources are "applied" by their very nature. They depend upon many disciplines, including botany, zoology, economics, statistics, mathematics, chemistry, physics, and psychology. It is imperative that graduate programs-of-study balance applied coursework with that in the pure disciplines. This will assure that students are exposed to the latest information and advances in their disciplines. This approach should also

insure that disciplinary grounding does not become overly diluted by taking only applications coursework.

d. Encourage sabbatic and other leaves.

Unquestionably, one result of maturity will be an increase in the number of faculty who will request sabbatic leave. There is little argument that as the faculty become more senior, more individuals should be encouraged to take leave to upgrade their professional efforts and to keep abreast of new technologies and changes in their specialty areas. These leaves should have an important and positive impact on faculty classroom and research performance. A vigorous sabbatic program would improve the teaching/learning environment but only if support (faculty positions and cost-savings passed back) is given to departments during a member's leave.

e. Increase the level and visibility of the Visiting Scholar Program.

The Visiting Scholar Program stimulates thought among our faculty and students, acquaints visitors with our activities and brings increased visibility to the School and its programs by bringing prominent academicians, practicing professionals, and other leaders to the Campus. Thus, the program deserves vigorous support. Provisions should be made to print and distribute major addresses in addition to travel support for a minimum of three scholars per year in the School.

f. Encourage the involvement of postdoctoral personnel in research programs.

Postdoctoral fellows can play an important role in specialties with a sizeable, mature graduate program. Postdoctoral fellows can help with training graduate students in basic scientific skills, bring needed expertise into laboratories, and free faculty time for other responsibilities. Postdoctoral positions should be encouraged in instances where they can enhance and enrich the basic mission while the primary emphasis must remain on graduate programs.

Goal #3: To strive for excellence in research through the use and exploration of new scientific concepts and applications for the benefit of society, industry, and government.

Strategies

a. **Identify specific research areas in which the School wishes to excel, expanding into new research areas only when capable personnel and resources for meaningful contributions are assured.**

A number of strong research thrusts have been established in the School. These thrusts should be maintained, as long as they remain relevant. New research areas should also be initiated, but only when the faculty and other resources exist for meaningful contributions. The School and the constituencies it serves will benefit more from high levels of excellence in selected areas of research than from superficial involvement in a broad spectrum of areas.

b. **Emphasize long-term research thrusts that are consistent with the areas identified in *Strategy a.***

Research in natural resource management requires long-term efforts. Sustained research in wood science, forestry, wildlife, fisheries, recreation, and related areas necessitates continued inputs for study maintenance and analysis beyond the usual grant and contract funding time periods. Funding mechanisms should be developed whereby long-term initiatives are possible for the priority research areas of the School.

c. **Focus efforts for generating extramural research support on long-term funding sources.**

Stability in research funding can be fostered through endowments, industry cooperatives, and large projects that are interdisciplinary in nature. Larger research projects will likely involve teams rather than individuals. Participation in long-term, team-oriented research projects must be recognized and rewarded appropriately to be successful.

d. **Provide adequate institutional resources for new faculty and for established faculty who wish to embark on changes in research direction.**

Maintaining the School as a premier research program will require the concentration of internal resources into strategic areas. New faculty members must be provided easily obtained internal resources with which to establish a fundamental research program, upon which a successful grant-supported program can be founded. As faculty mature, some will surely wish to redirect their scholarly interests. They also need internal resources to re-establish their

credentials. At the same time, evaluation criteria must change to recognize that the accomplishments of senior faculty should be more important and less frequent than the resume-building accomplishments of junior faculty.

Young faculty need to establish a well-focused research program as well as a high quality teaching and/or extension program. Funds for assisting these faculty to start up would free them, to some degree, from pursuing small, short time-frame and unfocused research contracts. At the same time, such a program would permit concentration on their teaching and extension missions.

e. **Remove institutional barriers to the conduct of interdisciplinary research.**

Historically, research has been compartmentalized by academic unit because of tradition, need for unit identity, organizational expediency, and a host of human attributes common to academic personalities. However, the nature and scope of research problems and their funding have changed in the last 10 years. Interdisciplinary, team-oriented approaches have emerged as effective research vehicles and receive favor by funding sources. Existing institutional barriers to the team approach limit aggressive development of long-term team organization. Some of these barriers include "counting" graduate students by department, subtle discrimination of "team-players" in the promotion and tenure process, protection of equipment due to very limited maintenance and replacement funds, and space allocations.

Goal #4: To integrate the School's research program with the teaching program, especially at the graduate level, and with the extension program.

Strategies

a. **Divide long-term research projects into identifiable subprojects suitable for graduate student thesis and dissertation research.**

The objectives and schedules of sponsored research do not necessarily conform to the objectives and schedules of graduate student research. In order to provide students with the best education and training in research performance, faculty must find ways to subdivide their funded or long-term research into discrete pieces which teach graduate students how to plan and conduct research and allow them to contribute to the overall project. Graduate student research should complement faculty research but not be synonymous with it.

b. **Involve students in the total research process.**

Formal coursework is only a portion of graduate education. Graduate students, especially doctoral students, need a broad research education which involves them in all of the processes, techniques, communications, and

negotiations of research. They should not only be technically skilled to carry on research but must be cognizant of the processes by which research ideas are created and "sold." More emphasis must be placed on total graduate student involvement in research. The involvement of undergraduates in research should also be encouraged. Through the introduction of the research process to undergraduates it might be possible to produce better informed practitioners and possibly expand the potential graduate candidate pool.

c. Include extension personnel in the process of identifying and conducting long-term research programs.

To be of maximum value, research results must be interpreted and made available to potential users in a timely manner. Methods of knowledge transfer should be included in research plans as they are developed and funded, i.e., technical publications, popular articles, workshops, seminars, video tapes, etc. Collaboration between research and extension personnel at the beginning of new, expanded, or revised research projects will provide the knowledge and experience of additional personnel to research planning and increase efficiency of the total research and technology transfer effort. Close working relationships between researchers and specialists from the outset of new research projects will help insure rapid dissemination of useful information as it is developed.

d. Expand opportunities for interaction with faculty and students outside their immediate areas of specialization.

One inherent danger of applied specializations in education is that it is easy to become disassociated from a discipline and develop a narrow view of research and educational opportunities. This often leads to myopia and graduate in-breeding. Interaction should be sought, both formally and informally, with faculty and research programs outside of departmental groups. This can be visibly promoted by joint seminars, participation on graduate committees, research on broad issues, and joint "housing" of graduate research assistants.

e. Organize major international symposia on topics of importance to the mission of the School.

Opportunities exist for "publicizing" the high quality of the School with the maturation of School faculty and allied research programs. Sponsoring international symposia in such areas as quantitative methods, wood science topics, and endangered species would help define us as world-wide leaders in the area of natural resource management and utilization. We are well positioned in terms of faculty notoriety to spearhead such efforts. Faculty should also be encouraged to participate actively in international research organizations and programs.

Goal #5: To provide students not enrolled as majors in the School's degree programs with an understanding and appreciation of renewable natural resources so they can assume leadership roles in their communities and foster a natural resource conservation ethic within the general public.

Strategies

a. **Offer elective undergraduate courses for non-majors within the University.**

Identify major topics in the renewable natural resources field that directly or indirectly impact the quality of life in a regional, national, or international context. Develop and offer a series of independent, no-prerequisite, mid-academic-level courses that would appeal to the University's undergraduate community. Honors course offerings by the School faculty should also be encouraged. Identify and offer technically-oriented courses for non-majors that deal with characteristics and uses of renewable natural resource commodities.

b. **Seek recognition and approval of a sixth area in the University Core Curriculum that deals with responsible citizenship as related to the management and utilization of natural resources.**

Identify and develop courses that focus on the concept of long-term survival of the human species on Earth. The idea is to integrate technology development; social, political, mathematical and natural sciences; world economics; and communication as they relate to the management and utilization of natural resources.

c. **Foster faculty participation in campus-wide informal educational opportunities.**

Breadth of background is important in developing informal and unbiased opinions, and in being able to evaluate critically situations outside one's area of scientific specialty. The "university atmosphere" provides a unique opportunity to learn about and participate in topics and areas outside the area of primary focus. Creative interaction between faculty in fringe areas of interest is important in gaining and maintaining perspective in any field. Innovative thinking is one of the keys to organizing and carrying out research that will result in the discovery of new knowledge. Finding out about and taking part in the functions of the numerous "centers" and "institutes" within the University, and forming informal, technical interest groups should be encouraged. Involvement in research projects, through committee participation, is also a means for faculty to gain new ideas on how to approach and solve problems.

d. Identify and develop minors in "renewable natural resources" for students in other departments and colleges.

Undergraduate students in non-forestry and wildlife curricula could use a natural-resources minor to complete "cognate area" requirements in their majors or to enhance their understanding of natural resource disciplines. For example, the Humanities Program in the College of Arts and Sciences offers a number of interdisciplinary concentrations. Students wishing to pursue a degree in humanities, science, and technology under the Liberal Arts and Science (LASc) major combine the humanities, science, and technology concentrations in (a) history, philosophy, and sociology of science and technology and (b) a specific program in one of the colleges of Engineering, Architecture and Urban Planning, Agriculture, or Human Resources. Similar programs in natural resources should be available to students in other disciplines.

e. Provide informal educational opportunities for students to learn more about natural resources and their management.

The understanding by students of natural resources and their importance to everyone is at a low level. In addition, the perception of professions within the School by the University Community is often far from reality. We should take advantage of opportunities to provide educational information that would lead to a real and better understanding of the importance of natural resources and the professions that deal with their management. Examples of ways to accomplish this include sponsoring campus-wide programs by student chapters of the professional organizations, providing educational material on the Virginia Tech networks, and sponsoring informal workshops for students and others in the university community that focus on current natural resource and environmental problems.

Goal #6: To better disseminate knowledge and to provide a new program of techno transfer to the School's direct constituencies and the general public in orde enhance the benefits, goods, and services obtained from natural resources of the state and surrounding region.

Strategies

a. **Target and develop highly visible, nationally-focused natural resources continuing education/outreach specialty areas which identify the School's expertise in outreach programming.**

The School can become nationally recognized for its continuing education programs. By utilizing all faculty expertise in enhanced public service programs, we can attract nationally known leaders, administrators, and scientists to participate in our outreach programs and increase the quality of services offered and the recognition of the School and its faculty.

b. **Develop and offer intensive educational courses for mid-level professionals.**

Numerous Continuing Education opportunities for professionals are available in many forms and from many organizations, including Virginia Tech. However many opportunities are unstructured, conducted on an irregular schedule, and often are not complete in fulfilling the needs of resource professionals. It is proposed that structured, intensive course sequences of 1-3 weeks duration on a planned basis, offering concentrated study in areas such as natural resource management and economics, personnel management, communications techniques, and business management for mid-career resource personnel be developed and implemented.

c. **Strengthen procedures to identify areas of education and information needs for use with pertinent audiences.**

Programming topics for our audiences often are based on state and national priorities or on standard subjects to update clientele in specific areas, e.g., cost-share programs, water quality programs, insect and disease outbreaks, Christmas tree management, farm pond maintenance, lumber drying. Other programming is based on perceived needs of clientele determined by specialists and occasionally requested by interest groups. To better meet programming needs of natural resource audiences, effective means need to be devised to receive advice from clientele groups on program topics and formats most useful to them.

d. **Develop means to promote and advertise extra-curricular educational programs.**

Better participation in educational programs, particularly continuing education courses for professionals, can be expected and can be of greater value to prospective participants if major educational offerings are scheduled and advertised further in advance, allowing individuals to select and schedule courses to be attended. Earlier planning of courses and effective distribution of course offerings on a regular basis should be implemented.

e. **Reward teaching and research faculty for active involvement in the outreach program of the School.**

The total public service mission goes beyond Extension responsibilities and should involve most faculty. Systems to reward non-extension faculty for public service activities – developing and teaching short courses, participating in workshops, providing expertise when requested – will greatly assist in increasing the public service programs of the School. Similarly, procedures to encourage research faculty to publish in popular outlets and easily understood formats, in addition to technical journals, should be put in place.

f. **Expand the use of traditional and emerging technologies (video tapes, satellite broadcasting, computer software) to reach specific audiences and the general public with information about School products and programs.**

Better communication with the constituencies of the School and with the general public are essential to optimize utility of School development, to build and maintain support for the School's programs, and to attract outstanding students at all levels. All emerging new technologies, potentially useful in disseminating educational materials and information, should be evaluated and used in programs to enhance the overall effectiveness of outreach and continuing education efforts.

g. **Expand the numbers of resource professionals working with our constituencies.**

We are physically limited in the amount of programming possible, particularly with private landowners, by the numbers of professionals available. Additional specialist help is doubtful in light of budget restrictions. Consideration should be given to employing area extension agents for natural resources programming for clientele in major forested regions of the State.

Final Message

The goals and strategies in this plan are not only a practical guide for the future but are also a philosophy of conduct. Some of the goals are certainly not new since they are characteristic of the approaches of all academic units in land-grant universities, but they represent an important reaffirmation of continued effort in these areas. Other goals, however, are new ideas and endeavors for the School of Forestry and Wildlife Resources. In fact, some of these "new" ideas are the direct result of the maturing of the School's faculty and programs as well as the firming of the interrelationship of the three departments. This maturity and cohesiveness can provide great benefits in high quality education, research, and extension that could not be provided by a "younger," less interactive unit. However, this maturity and interaction need to be nurtured and well administered to continue to achieve excellence in the performance of our mission. We must continue to capture and reinforce excellence in organization as well as individual personnel through thoughtful development of our administration, organization, and short-term performance goals.

It is also evident that the education and training of new leaders in the management, development, and scientific study of natural resources and their utilization need to be different from a decade ago. The public will be involved actively in natural resource policy decisions at all levels, and successful resource professionals must be well-grounded in a wide variety of issues. Those involved with resource development and utilization must devise and use tools to better understand the demands of the resource and the marketplace. The School of Forestry and Wildlife Resources must keep abreas of these needs in its teaching, research, and public service functions and educate personnel equipped to meet the challenges and complexities of natural resource management.

The long-range plan calls for extraordinary efforts towards evaluating, modifying, and improving the educational experience of our students. This heightened sense of responsibility for assuring educational quality will require a School-wide dedication to all aspects of the educational endeavor. Historically, faculty have acted as individual entrepreneurs in the classroom. Educational reform will require that we act as a team, formulating course content and blending teaching mechanisms, and assuming responsibility for group efforts in assessment, curriculum, course design, and total program content.

Facilities available to the School are strained to the breaking point. Space is a recurring theme in faculty complaints. The need for academic space is one of our most serious constraints presently and in the future. Important space needs are being sacrificed relentlessly for urgent space needs; laboratories are converted to student space; student space is converted to storage space.

Virginia Tech and the School are well recognized as leaders in the development and application of advanced technologies. Our students are highly sought – and highly

successful – because of their education and skills with these new technologies. This essential facet is perhaps the most evanescent of qualities. Technology advances continuously. Our programs and equipment must advance also. Continual additions and upgrading of equipment are imperative. As we pursue excellence we must change the nature of faculty evaluation. As business leaders have begun to realize, effectiveness of an institution depends on rewarding people according to their willingness to take risks, rather than according to their iterative accomplishments. As true as this statement is for a business, it is more true for a university, the purported home of ideas and ideals. The thrusts of this plan, and the more basic goals of the University, imply that faculty must engage in activities different from those of the past. We espouse long-term development of research strength, increasing international orientation, and re-vitalization of faculty through study/research leaves. All of these require a willingness to forego traditional "resume builders" in trade for venturesome group efforts. The reward system must change if we are to change.

Administrative autonomy of the School is central to this plan. We recognize that independence has uncertainties. However, like any high return investment, one weighs the potential return against the costs. This is an investment we strongly desire to make.

The three departments in the School are separate but not independent units. They wish not only to preserve this interrelationship but to enhance it through an even more independent identity and function for the School. Therefore, it is necessary for the School to gain full responsibility and accountability for its programs and their management. The implementation of this plan and the continued pursuit of excellence are contingent upon the preservation and enhancement of the departmental interactions as well as greater control of our own destiny through independent School or College status.

LONG RANGE PLANNING COMMITTEE

Dr. Gregory J. Buhyoff, Professor (Chair)
Dr. Harold E. Burkhart, Thomas M. Brooks Professor
Dr. Robert L. McElwee, Professor
Dr. Thomas E. McLain, Professor
Dr. Larry A. Nielsen, Professor
Dr. David Wm. Smith, Professor

ADDENDUM B

Program, 1991 School Honors Banquet

SCHOOL OF FORESTRY
AND WILDLIFE RESOURCES

26th Annual

HONORS BANQUET

March 27, 1991
6:30 P.M.
Owens Hall

VIRGINIA POLYTECHNIC INSTITUTE
AND STATE UNIVERSITY

Program

Dinner
Introduction of Guests
Presentation of Awards

Banquet Address:

"The Commonwealth's Natural Resources: Present and Future

by
The Honorable Elizabeth H. Haskell

Secretary of Natural Resources
The Commonwealth of Virginia

SPECIAL SCHOOL AWARDS

THE A. B. MASSEY HONORARIUM

Alumni and friends established this award in 1965 to honor the outstanding contributions of Professor A. B. Massey. The award is presented annually to two graduate students who have displayed outstanding academic and professional leadership. Presentations by Dr. Robert Adams for the Departments of Forestry and Wood Science & Forest products and by Dr. Larry A. Nielsen for the Department of Fisheries and Wildlife.

THE ALUMNI AWARD FOR OUTSTANDING SCHOLARSHIP

The Alumni Award annually honors a graduating senior who has demonstrated exceptional academic, extracurricular, and professional leadership. Presentation by Dr. David Wm. Smith.

THE OUTSTANDING SOPHOMORE SCHOLAR AWARD

The Chi chapter of Xi Sigma Pi (the National Forestry Honorary Society) began this award in 1966 to recognize the sophomore with the highest quality credit average after three semesters in the school. Presentation by Duane Means, Forester of Xi Sigma Pi.

THE CURRICULUM CLUBS' FACULTY AWARD

The school curriculum clubs annually honor a faculty member in recognition of dynamic teaching ability, excellent professional attitude to teaching, and outstanding student relationships. Presentation by Bill Ensign, President of the American Fisheries Society.

THE CURRICULUM CLUBS' OUTSTANDING MEMBER AWARDS

These awards annually recognize members of each club who have made outstanding contributions to their organizations.

SPECIAL GRADUATE FELLOWSHIPS

Robert S. Burruss Fellowship
Kevin L. Gericke

William J. Dann Fellowship
Michael E. Patterson

SPECIAL UNDERGRADUATE SCHOLARSHIPS

Virginia Forestry Association
Victor W. Steward Scholarships
Benfield, Richard S.
Engle, Catherine A.
Hampton, Thomas M.
Rutlin, William M.
Steidel, Timothy L.
Georgia Pacific Foundation Scholarships
Lafon, Nelson W.
Rider, Daniel R.
William and Mable Stuermann Scholarships
Means, Duane E.
Nelson, Robert R.

Jeffrey Andrew Fuerst Memorial Scholarships
Deller, Amy S.
Henson, Angeline L.

Henry S. Mosby Memorial Scholarships
Eason, Thomas H.
Peterson, Marc R.

Honorable & Mrs. Shelton Hardaway Short, Jr. Memorial Scholarships
Adams, John M.
Adams, Will J.
Martin, James C.
Ward, Timothy M.
Worrell, Elton G., Jr.

William M. Carter Scholarship
Miller, Daniel A.

Thomas M. Brooks Scholarships
Cain, Brennan P.
Deener, Herbert L., III

Union Camp Corporation
Scheerer, Greg A.

Chesapeake Foundation Scholarship
Shelton, David P.

Champion International Corporation Scholarship
Lenham, Philip J.

Richard B. Vasey Scholarship
Grow, York D.

Bartlett Tree Foundation Scholarships
Gunter, James T.
Anderson, Jason D.

Roanoke Valley Horseman's Scholarship
Forren, James S.

Reese McCormick Scholarship
Harris, Christopher S.

John Lee Pratt Freshman Merit Scholarships
[illegible] Andrew W.
[illegible] Bradley S.
[illegible] Y
[illegible] L.
Glacken, [illegible] J.
Goerlich, Daniel L.
Mihalik, Stacy L.
Remer, Leah M.

John Lee Pratt Animal Nutrition Senior Research Scholar
Henson, Angeline L.

Cyrus McCormick Undergraduate Scholarships
Cheynet, John A.
Gauntt, Amy S.

William Powers Sadler Scholarships
Clark, Jeffrey S.
Siebert, Scott C.

Southern States Cooperative Incorporated Scholarships
Meade, Gregory S.
Hobgood, Emily V.

MEMBERS OF XI SIGMA PI
NATIONAL FORESTRY HONORARY SOCIETY

Bartlett, John
Bittner, Linda
Bowman, Jake
Buresh, Stephanie
Cain, Brennan
Clarke, John
Deener, Herbert
Eason, Thomas
Egolf, Arthur
Engle, Catherine
Gericke, Kevin
Hampton, Tom
Hayslette, Steven
Hensen, Angie
Hewett, Dave
Hobgood, Emily
Houghton, Damon
Hunt, Andrew
Loving, Easton
Marcus, Paula
Martus, Christopher
Mason, Marion
McElroy, Heather
Means, Duane
Miller, Daniel
Miller, William
Nelson, Robert
Patterson, Mike
Plummer, Amy
Rider, Daniel
Scherer, Greg
Short, Austin
Sluss, Richard
Szabo, Beth
Thompson, Jesse
Ward, Mark
Warren, Travis
Wimble, Katherine

OFFICERS OF STUDENT ORGANIZATIONS

Forest Products Club
Jeffrey D. Brulé, President
Chris Martin, Vice-President
Brian Massie, Vice-President
Jason Anderson, Treasurer

Forestry Club
Thomas Fitzgerald, President
Cheron Farnwalt, Vice President
Hilary Smith, Secretary
William Rutlin, Treasurer

Wildlife Society
John Loegering, President
Julia Komdorfer, Vice-President
Linda Bittner, Secretary
Dan Miller, Treasurer

Xi Sigma Pi
Duane Means, Forester
Emily Hobgood, Associate Forester
Kevin Gericke, Treasurer
Brennan Cain, Ranger

American Fisheries Society
Bill Ensign, President
Nancy Mason, Vice-President
Todd Richards, Treasurer
Ryan Barnes, Secretary

Society of American Foresters
Rob Nelson, President
Tim Dorrell, Vice-President
Emily Hobgood, Treasurer
Cheron Farnwalt, Secretary

SCHOOL OF FORESTRY AND WILDLIFE RESOURCES UNDERGRADUATE HONOR STUDENTS

Accumulated Grade Point Average of 3.50 - 4.00

Cain, Brennan P.
Carter, Heather, Y.
Cranton, John A.
Deener, Herbert L.
Delwiche, Rebecca L.
Eason, Thomas H.
Felter, Gina C.
Gauntt, Amy S.
Grow, York D.
Hagenston, Cindy E.
Hayslette, Steven E.
Karagosian, Adam H.
Keefer, Gabrielle A.
Lafon, Nelson W.
Means, Duane E.
Merwin, Deirdre S.
Mihalik, Stacy L.
Miles, Christine M.
Miller, Daniel A.
Nelson, Robert R.
Perkins, Laura E.
Peters, Daniel M.
Petersen, Marc R.
Plummer, Amy E.
Seinwill, Anne E.
Spradlin, Warren E.

Accumulated Grade Point Average of 3.00 - 3.49

Aber, Shelly L.
Allen, Jennifer C.
Anderson, Karin M.
Barnes, Curtiss R.
Bartlett, John G.
Bell, Andrew W.
Bowman, Jacob L.
Brown, Jeffrey N.
Buford, Ernest W.
Buresh, Stephanie F.
Burlingame, Matthew N.
Cecchini, Joseph D.
Chandler, Kristal L.
Cheynet, John A.
Clark, Brian N.
Clark, Jeffrey S.
Deller, Amy S.
Dodd, Denise R.
Engle, Catherine A.
Erber, Angela M.
Ferdinandsen, Joseph C.
Flick, Scott L.
Goerlich, Daniel L.
Gorman, Sharon L.
Grant, Donna S.
Habicht, Mindy M.
Hampton, Thomas M.
Hobgood, Emily V.
Howard, Zachary C.
Hunt, Andrew N.
Jones, Mark D.
Kegley, Samantha W.
Lavery, Amy S.
Marcus, Paula L.
Martin, James C.
Mason, Marion E.
McElroy, Heather L.
Merica, Jesse A.
Mikesell, Jennifer L.
Miller, George T.
Miller, William R.
Needham, Kim A.
Nichols, Sarah F.
Parker, Charlene F.
Preston, David P.
Puckett, Kevin M.
Rankin, Russell A.
Remer, Leah M.
Rider, Daniel R.
Roesch, Nicole L.
Rutlin, William M.
Sammons, Steven M.
Sappington, Robert G.
Schmidt, Kerri
Scheerer, Greg A.
Schroeder, Andrew F.
Shelton, David P.
Shrader, Gregory R.
Simmons, Emily J.
Smith, Jason L.
Steidel, Timothy L.
Szabo, Beth A.
Thompson, Gregory S.
Thompson, Jesse W.
Ward, Timothy M.
Warren, Travis K.
Watson, Lisa E.
Watson, Trevor M.
Weissler, Lena S.
Wilson, Tamara L.
Wimble, Katherine H.
Zawacki, William T.

GRADUATE STUDENTS RECEIVING FINANCIAL SUPPORT

Anderson, Kari J.
Andrews, Jeffrey
Andrews, Lisa
Avila, Olga
Bittner, Linda A.
Blythe, William G.
Borkholder, Brian D.
Bosworth, Brian G.
Brummel, Kenneth
Bryan, Roger D.
Bryan, Sheryl A.
Carr, Deborah
Chandler, Sheri K.
Chen, Zhanging
Clarke, John W.
Comly, Lisa M.
Conner, Erin E.
Cox Eric
Creamer, Allan E.
Cummins, James L.
Dave, Vipul B.
Dean, Denis
Doruska, Paul
Duncan, Carla
Easton, Robert S.
Eberhardt, Thomas L.
Egolf, Arthur
Emery, Brian K.
Ensign, William E.
Fehringer, Janet
Ferguson, Mark T.
Foliente, Greg C.
Forbes, Craig L.
Frazier, Charles E.
Fredericksen, Todd
Gamalath, Sandhya
Garnier, Gil B.
Gericke, Kevin
Goldammer, Jay
Grasman, Keith A.
Green, Champe B.
Groeschl, David
Groshens, Thomas P.
Gueye, Moumar
Haering, Thomas
Hansen, Eric N.
Hartley, Ian D.
Hauser, James
Helm, Amy
Hewitt, David
Hofmann, Klaus
Hoover, Randall S.
Houghton, Damon
Idrus, Roszehan Mohd.
Iiju, Paul A.
Inciong, Ma. Estela J.
Jhala, Yadvendradev
Johnson, Daniel
Kasbohm, John W.
Keenum, Gail M.
Kenney, David
Kerpez, Theodore A.
Kim, Dong
Koloszar-Peszlen, Ilona
Kralovec, Mary L.
Laestadius, Lars
Lang, Elemer M.
Lauer, Ira E.
Leary, Pamela
Leslie, Susan S.
Li, Mingde
Lin, Wenjie
Liu, Jiping
Loegering, John P.
Loving, Roy
Mackes, Kurt H.
Martus, Chris
Mason, Nancy A.
McCann, Mary M.
McMullen, Robyn
McMullin, Steve L.
Meyer, Chris J.
Meyer, Kelly J.
Michaelson, David L.
Molz, Erica B.
Morton, John M.
Munsey, Donald
Murray, Norman L.
Nowak, Jaroslaw
Nunley, Chad
Oliveria, Willer de
Ong, Robert
Owen, Michael D.
O'Connell, Martin
O'Connor, George
Patterson, Michael
Powell, David
Punches, John W.
Rauschenberg, Nancy
Reddy, Vijaya S.
Regalado, Carmen
Reyner, Kris
Rhodes, Walter E.
Richards, Todd A.
Roe, Jeffrey
Ryder, Cheryl E.
Sabo, Matthew
Samuelson, Lisa
Schneider, William
Schrading, Eric P.
Schrage, Michael W.
Senchak, Suzanne
Short, Eli
Sluss, Richard
Stanovick, John S.
Stein, Henry
Stoeckel, Joseph N.
Stubbs, Christopher
Sullivan, Joseph P.
Sumithran, Stephen
Temple, Alan J.
Tippett, Mark
Tonkovich, Michael J.
Trani-Griep, Margaret K.
Tyszko, Piotr
Uzee, A. Meg
Vadas, Robert L.
Van Winkle, Steve C.
Verkasalo, Erkki I.
Weih, Robert
White, Maurice W.
Wiedenbeck, Janice K.
Will, Rodney
Wise, Stanley A.
Wylezinski, Andrzej
Yang, Changguo
Young, Michael
Young, Pamela J.
Yow, David L.
Yue, Junping
Zhou, Dan

SOURCES OF FINANCIAL SUPPORT-1991

Adhesive & Sealant Council
AKZO America, Corporation
Alberta, Canada, Forestry Service
ALCO Corp.
American Research Corporation
ARCO Chemical Corporation
Appalachian Hardwood Export Center
Appalachian Power Company
Arrowhead Products
Birdsong Peanuts, Corp.
Bio Regional Energy Associates
Boise Cascade
Borregaard Industri.., Ltd.
Bowater North American Corp.
Brandermill, Inc.
Mrs. Margaret S. Burruss
Burke Parsons Bowlby Corp.
Center for Innovative Technology of VA (CIT)
Champion International Corp.
Chesapeake Corporation of VA.
Culpeper Wood Preservers, Inc.
Mrs. William J. Dann
Dow Chemical Co.
Dwight R. Chamberlain
Electric Power Resources Institute
Environmental Protection Agency
Executive Research Associates
Federal Paper Board Corp.
Fettig, Inc.
Franklin Equipment Co.
G. Scott Francis
Georgia Pacific Corp.
George B. & Mary Ragsdale
Gray Lumber Company
Hawaiian Sugar Planters Assn.
Inland Rome, Inc.
International Paper Company
Iowa State University
James River Lumber Company
Julian N. Cheatham Family
Koppers Company
Lowe's Companies, Inc.
Lumber Manufacturers Association of VA
McGill University
Michigan State University
Mineral & Mining Resources Research Inst.
Nancy S. Reynolds Endowment
National Aeronautics & Space Administration
National Council for Air and Stream Improvement
National Energy Administration, Sweden
National Oak Flooring Manufacturers' Association
National Science Foundation
National Wooden Pallet & Container Association
Nekoosa Papers, Inc.
Northrup, Inc.
Penn Virginia Resources Corp.
Philip Morris USA
Pocahontas Land Corp.
Powell River Foundation
Pratt Foundation
Primland, Inc.
Procter & Gamble Cellulose Co.
Pulp & Paper Research Institute of Canada
Robert J. Kennedy
Robertson Corp.
S.D. Warren Co.
Sheldon Lumber Company, Inc.
Shelton H. Short III and Jean S. Short
Smith Richardson Foundation
Smithsonian Institution
Solar Energy Research Institute (SERI)
Sorbilite, Inc.
Southern States Cooperative
State Council of Higher Education of Virginia
Stone Container Corp.
Mable B. Stuermann
Tennessee Valley Authority
Thomas H. Jones
Thomas M. Brooks Estate
Thomas N. DePew
Timberjack, Inc.
Timber Trade Organization of Malaysia
Union Camp Corporation
USAID - Senegal
U.S. Borax Corp.
United States Department of Agriculture:
- Cooperative Extension Service,
  - Washington Office
- Cooperative States Research Service
- Forest Service:
  - Competitive Grants Program
    - Mark. Doctoral Fellowships
  - Forest Products Laboratory
  - Jefferson National Forest
  - North Central Forest Experiment Station
  - Northeastern Forest Experiment Station

SOURCES OF FINANCIAL SUPPORT (Continued)

- Region VIII, Atlanta
- Southeastern Forest Experiment Station
- Southern Forest Experiment Station

United States Department of Defense:
- United States Army

United States Department of Energy

United States Department of Interior:
- Bureau of Mines
- Fish and Wildlife Service
- National Park Service
  - Mid-Atlantic Regional Office
  - Shenandoah National Park

USGS
- Office of Surface Mining

Utah State University

Virginia Agricultural Council

Virginia Center for World Travel

Virginia Christmas Tree Growers Assoc.

Virginia Corn Commission

Virginia Department of Agriculture and Consumer Services

Virginia Department of Conservation and Historic Resources

Virginia Department of Forestry

Virginia Division of Planning & Recreation Resources

Virginia Electric Power Company

Virginia Fibre Corp.

Virginia Forestry Association

Virginia Soybean Commission

Virginia Tech Library System

Virginia Water Resources Research Center

West Virginia University

Westvaco Corporation

Weyerhaeuser Timber Co.

Willamette Industries

Winrock International

SCHOOL OF FORESTRY AND WILDLIFE RESOURCES

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY