



G. ROBINSON GREGORY — ECONOMIST AND FORESTER

RICHARD J. BRAZEE

G. Robinson (Bob) Gregory's career is difficult to summarize. Trained as both a forester and an economist, Gregory uniquely combined silvicultural expertise, rigorous economic training and unmatched international policy experience. More importantly, Gregory consistently brought (and still brings) this striking combination of abilities and expertise to bear on a broad range of research, teaching and policy issues.

Equally impressive are Gregory's accomplishments. To claim that during his career Gregory made substantive contributions in teaching, research and policy severely understates his contribution to forest economics. A short list of Gregory's contributions includes arguably the best textbook in English for almost three decades, a seminal paper on multi-

ple use (reprinted in this issue of the *Journal of Forest Economics*) and the successful introduction of economics into forest policy debates of several countries. These accomplishments are magnified by the work of an extremely impressive and able group of graduate students that he mentored.

TIMBER CRUISER, PILOT, AND SCHOLAR

"My father," Gregory wrote, "who came to the U.S. in 1904 from England, was a Methodist minister as had been his father, grandfather, great grandfather — back to the time of John Wesley, the founder of Methodism." Born September 1, 1915 in Cass City, Michigan, Gregory spent his early years in a series of small Michigan towns "primarily because

Richard J. Brazee, Department of Natural Resources and Environmental Sciences, University of Illinois, Urbana, IL 61801, USA.

This portrait would not have been possible without the active assistance of Bob Gregory and several of his students and colleagues. I am indebted to Bob for both providing written and oral biographical information, and for a copy of the report he wrote on retiring from the Pack Professorship in 1983. This information greatly simplified background research. Bob's former students and colleagues were uniformly generous with their memories and their time, both of which were extracted from busy schedules on short notice. I thank Bill Banzhaf, Hans Gregersen, Perry Hagenstein, Gary Lindell, Bill Rockwell, Jeff Stier, Hank Webster and Ross Whaley. Any remaining errors or misrepresentations are mine.

Dad believed this was the best type of place to raise his family." Gregory enjoyed both the Michigan forests and hunting. A "very good shot," Gregory often hunted with his father in the Michigan countryside and forests, where his favorite small game was duck.

Gregory graduated from high school during the great depression. The following summer, he landed his first "real job, cruising timber on the Huron National Forest." In the fall Gregory entered what is now Central Michigan University, continuing to work summers for the Forest Service. He eventually decided to become a forest researcher, "graduating in 1938 with a major in biology and minors in chemistry, physics, math and english." To further his forestry education, Gregory immediately went to the University of Michigan, "where I took a second B.S. and a Master's degree in Forestry, graduating in 1940 with a major and thesis in silviculture."

As did many college graduates during the depression years, Gregory found a job almost immediately. "I started work a week after graduation," Gregory said, "cruising timber for the Forest Service in Oregon. We were cruising 'exchange lands,' areas of private timberlands that were being exchanged for timber from National Forest areas."

After several months, the Forest Service offered Gregory a transfer to cruise for bug-killed Ponderosa Pine. The teams were given three weeks of training, a

pick-up truck, maps, and their own area. Gregory's team started out some 15 miles by air — 45 miles by road — from Hat Point on the Snake River. The team worked its way back through 11 National Forests, making a 100 percent cruise on a mile long and half-mile wide plot, identifying all dead trees and why they died. "It was a great job," Gregory wrote, "and a wonderful introduction to western timberlands."

Gregory's next job returned him to a university. While at home for Christmas, after having finished his Forest Service job in November, Gregory received a telegram from Dr. Ted Coyle of Duke University, asking him to join a soil-site project, financed by the Rockefeller Foundation. Gregory joined the project in early 1941, performing the statistical analysis for a study of the effects of soil type, soil horizon depths, slope, aspect and other factors on pine growth in plots in the Duke Forest. It was Gregory's first exposure to regression analysis.

Gregory's next job, with the Northeastern Forest Experiment Station and the National Agricultural Experiment Station in Beltsville, Maryland, was "another great introduction, this time to experimental design and analysis." To learn more about statistical analysis, Gregory enrolled in school again, this time to take a statistics course given at the graduate school of the Department of Agriculture in Washington D.C.. In D.C. he met and started dating "a most interesting young lady," Ann Hano.

That semester Pearl Harbor was bombed; two months later, Gregory was approved for Naval Aviation flight training. Shortly after flight training, he and Ann were married. Gregory spent the rest of the war in the navy. His duties included flying PBMs (large flying boats designed for anti-submarine warfare) to protect ships carrying oil and bauxite in the Caribbean and around South America, and flying escort for ships carrying troops to Europe. During much of the war, Gregory was a Patrol Plane Commander, and Navigation Officer of the Squadron. "It was an exciting four years, but not an experience I would want to repeat."

After the war, Gregory went back to the Forest Service to — he thought — resume his old duties in silvicultural research. However, the Forest Service, in part prompted by a suggestion from Dean S. T. Dana¹ at Michigan, had other ideas. The Forest Service wanted Gregory to become a forest economist. Ironically, Gregory was not yet taken by the subject. "I hated economics. I thought that it was boring." Eventually, he agreed to try economics and was sent to Nachodoches, Texas, as a Forest Economist. "Like most such Forest Service people," Gregory said, "I had had no real training in Economics."

¹ Samuel Trask Dana was an influential, widely respected and semi-legendary manager, analyst and educator in the U.S.. His book *Forest and Range Policy*, originally published in 1956 and updated in 1980 after his death by Sally K. Fairfax, is still standard reading in forest policy classes throughout the U.S..

Gregory spent the next three years in Texas working under the rather loose but helpful supervision of Forest Service researcher William Duerr², who had training in economics but was stationed in New Orleans. After three years, Gregory decided to go back — again — to graduate school at the University of California at Berkeley. Even as a graduate student, Gregory's dissertation, which critiqued U.S. Forest Service harvesting patterns, was path-breaking. According to H. William Rockwell, Leader, Planning Section, Michigan Department of Natural Resources, "Bob Gregory's dissertation was one of the first, if not the first, modern theoretical work in forest economics."

After receiving his Ph.D., Gregory had assumed that he would return to the Forest Service, but Dean Dana intervened again. Dana recruited Gregory for the George Willis Pack Professorship, the oldest of the endowed professorships in the (now) School of Natural Resources and the Environment at the University of Michigan. Dana was so keen to recruit Gregory that although the Pack Professorship was originally designated for forest and wildland management, the University of Michigan officially changed the title of the position to "Pack Professor of Natural Resource Economics." Gregory would spend the next thirty-some years in this position. Both during his active career and after his retirement in 1983, Greg-

² Duerr, of course, is an extremely accomplished forest economist in his own right.

ory's work has received widespread recognition including a Doctorate of Law from Central Michigan University, and honorary membership in both the Finnish and Mexican Forest associations.

MULTIPLE USE

Gregory's papers in refereed journals cover a range of forest resource, products and marketing issues. "Bob was a pioneer in applying the more advanced theories of the 1950s to forestry problems. He built on the many new ideas in production economics, and combined these with the new ideas on timber supply and demand that Vaux and Zivnuska were developing. He added intellectual rigor to the forest economics specialty that was matched only by Bill Duerr, Hank Vaux and John Zivnuska in those early days,"³ writes William R. Bentley, President, Salmon Brook Associates.

The best known and most influential of Gregory's journal papers was "An Economic Approach to Multiple Use." This invited paper was published in 1955 as the first paper in the first issue of the first volume of *Forest Science*, and is reprinted in this issue following this portrait.

"An Economic Approach to Multiple Use" provides a formal model that includes multiple outputs. Prior to its publication,

standard forestry economics models focused on a single output, usually timber. "I started thinking about modelling multiple use management, when I was taking prelim exams at Berkeley, and wanted to pursue the topic further," Gregory recalled.

For foresters "An Economic Approach to Multiple Use" helped clarify the meaning of multiple use, and provided an illustration of the economics of multiple use management. But the paper's most important impact was on the public debate of national forest policies. Up through the end of World War II, timber management, rather than multiple use management, was a fairly straightforward reflection of how the U.S. Forest Service and most other agencies throughout the world viewed public forest management. Demands for recreation on the U.S. national forests were small. The depression years and WWII limited the travel opportunities of the middle and working classes. Wealthy members of society often chose to visit national parks rather than national forests.⁴ After World War II, the middle class began visiting the national parks in increasing numbers, followed by the working class in the sixties and seventies. Today the U.S. national for-

³ Forest economics only became a recognized field in the U.S. after World War II.

⁴ The perceived missions of the agencies are quite different. The U.S. Forest Service manages forests to reach goals. The U.S. National Park Service is charged with preserving the parks. The Park Service has interpreted its mission to encourage visitors to the parks, while until the late 1950's the Forest Service did not.

ests register roughly 300 million visitor days, an almost tenfold increase since the end of World War II.

Simultaneous with the expansion of recreational demands, demand for timber on U.S. national forests also increased severalfold. As a result, how to manage forests for multiple uses became a dominant issue for national forest policy and for the forestry profession. The U.S. Congress recognized the need for multiple use management in the Multiple Use Sustained Yield Act of 1960. The act defines multiple use as: "the management of all the various renewable surface resources of the combination that will best meet the needs of the American people; making the most judicious use of the land for some or all of these [forest] resources . . . with consideration being given to the relative values of the various resources, and not necessarily the combination of uses that will give the greatest dollar return or the greatest output." Gregory's analysis clearly anticipated these definitions, and more importantly provided a framework for implementing both definitions and the act.

The economics of multiple use forest management has been an enduring policy issue for the United States. The Forest and Range Renewable Resources Act of 1974 and the National Forest Management Act of 1976 are examples of major U.S. federal legislation that address multiple use management for national forests. Although the amenities consid-

ered now are different than they were in the 1960s, policy debates are still concerned with multiple use management. The well-publicized public debate on old growth harvesting and the Northern Spotted Owl is only one of several recent incarnations of debates that led to the Multiple Use Sustained Yield Act of the 1960s.

Forest economists also continue to examine multiple use management. The question, "how do we assess tradeoffs between timber and other forest services," remains important in the U.S., northern Europe and tropical deforestation debates. Gregory's analysis provides a solid conceptual foundation on which to place estimates of non-market forest amenities. Intellectual descendants of Gregory's analysis include such economics questions as: "How should multiple stands be managed for multiple use?" "How do we encourage nonindustrial landowners to change their production mix of timber and nontimber amenity benefits?" and "How do the relative values of timber and recreation change when the government is revenue constrained?"

INTERNATIONAL RESEARCH AND CONSULTING

Gregory is also well known for his work on using natural resources to enhance economic development. The number of international consulting assignments Gregory completed is extraordinary. Between 1960 and his retirement from the University of Michigan in 1983, Gregory com-

pleted over 30 separate assignments including ones in Canada (3 times), China, India (9 times), Indonesia, Liberia, Mexico (4 times), Nepal (3 times), Pakistan and Portugal. In addition, he worked for FAO in Rome 4 times, and in Central America for the Ford Foundation. This record is even more impressive given that some of the assignments were a year or more long. In addition to sabbatical leaves and leaves of absence, Gregory usually spent 4 months of other years overseas.

Gregory first became interested in the role of natural resources in economic development during his first sabbatical leave in the late fifties. During 1960–61 he worked as the Chief of Surveys and Economics Analysis, Forestry, in Rome for the FAO. "During that first 15 months leave I was in charge of all the Timber Trend studies of FAO, edited the Far Eastern one, designed the African one, and wrote much of the Latin American one, plus re-organizing the second European study. During my second assignment there (on leave 1966–67), I was Chief Officer for the Forestry Department's work on the Indicative World Plan for Agriculture," wrote Gregory.

In his report of the Pack Professorship in 1983, Gregory recalled, while at FAO, "... I developed the methodology for making the Indicative Plan for each FAO nation, each indicating the forestry effort necessary if that nation were to experience the income growth and population growth anticipated for the com-

ing decade. This evolved into a method of sector programming and enabled FAO to complete the Indicative Plan on time for its World Conference in 1969. This methodology was also used by the World Bank and many nations for forestry and several nations use it for other sectors as well."

According to Hans Gregerson, Professor, University of Minnesota. "Bob was the first of the well-trained forest economists to work for FAO. He helped introduce trend statistics at FAO."

Gregory returned most often to India, working closely with India's Planning Commission. "Among other things, we developed the concept of 'Forest Development Corporations' — semi autonomous public corporations to establish high-yielding plantation forests funded by the careful utilization of existing low-yield areas. As a result all Indian States created such corporations," Gregory wrote. "In 1977–78 I helped design and begin the 'Indian Institute of Forest Management' in cooperation with the Indian Institute of Management, Ahmedabad."

In Nepal during 1975–1977, Gregory developed a project monitoring and reporting system for all development projects in the country. The system allowed "agencies and ministers — especially the Prime Minister — to see how, and if, any particular development project was progressing." Prior to the adoption of Gregory's system, Nepal could not track its numerous development projects, which were spread across the

country and funded by several nations. "The system was reviewed by the King, approved and used to monitor all of Nepal's development projects, from airports to bridges, to hospitals, agriculture and natural resources," wrote Gregory.

In Mexico, Gregory helped design and establish the economic section of Mexico's forest research organization. In Portugal, he evaluated the government's plan to embark on a large public program of industrial expansion for pulp and paper. In Canada, Gregory was the Chief Economist for a team constructing an economic planning model based on the theory of stumpage price that Gregory had developed in his text, *Forest Resource Economics*. "The model covered the utilization of all of Nova Scotia's forest land, public and private. This also led to a conference in Quebec, where they adopted the Nova Scotia approach," recounts Gregory.

Assessing the contributions of this work is considerably more difficult than assessing journal publications.⁵ As Gregersen points out, "the best you can hope for is that five years later they have adopted your recommendations." However, Gregory clearly had an enormous impact:

⁵ First, the work is less accessible, usually published as reports. Second, the work occurred in several countries over a 20 year period. Third, given the research focuses on current policy questions of interest, it is difficult for the analyst to receive proper credit.

"Bob was responsible for introducing economics into the international forest policy debate. He had the right blend of technical rigor and a policy perspective."

Gregersen

"He had enormous influence. There are periods where particular people and institutions are extremely influential. This was true for Gregory and the University of Michigan. Although being at the University of Michigan was helpful, Bob deserves much of the credit, he was extremely talented."

Henry H. Webster, Project Director, Lake States Forest Resource Assessment, Lake States Forest Alliance.

"Bob entered international work at an ideal time for both him and the field. He thoroughly enjoyed the modern "Raj" aspects of the work while truly being dedicated to helping newly emerging nations."

Bentley

TEXTS

Gregory's textbook, *Forest Resource Economics*, published in 1972, immediately became the best selling forest economics textbook in English. It was still widely used throughout the world fifteen years later, when in 1987 Gregory published a substantively revised edition under the title, *Resource Economics for Foresters*.⁶

⁶ *Resource Economics for Foresters* is still in print.

The hallmark of both texts are careful reasoning and construction. "He gave both forest economics and natural resource economics more structure and content than people before him," said Bentley. Perry Hagenstein, President, Institute for Forest, Analysis, Planning and Policy, added, "His text with Duerr's and Worrel's marked a significant transition from previous texts. Not much has changed since."

Gregory began both texts with a review of basic economic principles, and the application of these principles to forestry production and forest industry. These sections are followed by analyses of a wide ranging set of forest issues including multiple use, investment decisions, benefit cost analysis, forest recreation, wildlife, international trade and economic development. Textbook innovations include multiple use, determination of optimal rotation in the Faustmann model using the soil expectation value, theories of stumpage price formation and the intertemporal links between supply and demand.

Both books' clear presentation of basic concepts is a Gregory signature. "In both his texts and lectures Bob was a great expositor of economic principles," remarked Rockwell.

In part the success of the text may be due to Gregory's insistence that the material be thoroughly "student-tested" before going to press. "Graduate students were the test audience for the first edition of his textbook. We spent a lot of time going

through the book," said Gary Lindell, Member, Society of American Forest Science and Technology Board, and retired Program Manager, U.S. Forest Products Laboratory.

TEACHING

The semester after Gregory went to the University of Michigan, he developed and offered courses in "Forest Economics" and in "Natural Resource Economics." "The Natural Resource Economics course was the first such course for undergraduates offered in the United States and, I believe, the second such course offered anywhere," Gregory wrote. Gregory taught both courses consistently during his time at the University of Michigan. As with most courses, enrollment in the courses increased gradually from an initial 7 students (5 graduate students) to 30–35 students a year by the early 1960s. Then came Earth Day. "The following semester's class opened with over 100 students of which 30% were graduate students," Gregory recalls.

Later Gregory developed a course in economic planning for resource development which drew on his international research and consulting. Although the enrollment was limited to 17 students each year, it attracted a strong and diverse group of international and domestic students, who specifically came to Ann Arbor during the eight week spring term to take his course. "From a teaching standpoint this was undoubtedly the most exciting course I had," said Gregory. By offer-

ing this course in the spring, Gregory was able to spend winter semesters engaged in economic development primarily in countries with tropical forests.

Overall, his students said, Gregory was "an excellent teacher," who worked hard to make his courses interesting. "His forest economics course caught me. I was a fairly typical forester with no interest in economics. Bob convinced me of the importance of economics in the forestry enterprise. Prior to the course microeconomics was an abstraction. Bob gave it a reality that I could see, smell and feel. I later got a Ph.D. under him in forest economics," said Ross Whaley, President, State University of New York College of Environmental Sciences and Forestry.

"Bob organized personal experience into an attractive framework," recalled Gregersen. "His teaching was classical for the period, but drew heavily on whatever examples were hot in his current work, be it timber supply and demand, development in Mexico or Peru, or America's forestry heritage from Dehra Dun. His exams were creative and required thinking — really the only thing we should ever examine professional students on, in my opinion," wrote Bentley.

Students remember his lecture style as being formal, personable and astoundingly clear. Again and again, his students, such as Jeffrey Stier, Professor, University of Wisconsin, talked about Gregory's ability to "peel off the facade and get to the crux. He was

excellent at identifying the important questions and cutting to the heart of the matter." "Bob could take, the most arcane econometric model and translate it into common sense," said William H. Banzhaf, Executive Vice President, Society of American Foresters. Of course, as Rockwell points out, to Gregory "economics was [just] common sense made difficult."

To make concepts easier to understand, Gregory used both teaching aids and creative imagery. For example to assist students with the almost universally difficult task of understanding isoquants and indifference curves, Gregory made a model of a 3-dimensional, production/utility surface out of styrofoam. The surface was mostly blue, with white level sets that could be removed to be projected as isoquants or indifference curves.

Gregory's courses were both conceptually and technically rigorous. Bentley's description is typical, "Bob was the first professor I know of to teach calculus in his undergraduate forestry and natural resources classes — I believe he started in the mid-1950s. I was impressed when I arrived at Ann Arbor in 1960 as a master's student. Bob influenced my teaching by example — never underestimate what your students can learn!"

ADVISING

"I believe a major part of my own research effort shows only in the work of 'my' graduate students

— those whose Doctoral, and sometimes Master's, Committees I have chaired and whose work I have directed," Gregory said.

Using virtually any criteria, Gregory guided an outstanding crop of doctoral and masters students. While at the University of Michigan, he chaired committees for 34 Ph.D. students, and for 30 additional masters students.⁷ It is virtually impossible to do anything in the field of forest economics without encountering one of Gregory's students or Gregory's students' students. The list of his students' positions include several college deans (including College of Forestry, Dehra Dun, India), a college president and a university chancellor, chiefs and directors of national forest ministries and departments in many countries, presidents of firms and nonprofit organizations, leaders of and consultants to the Asian Bank, World Bank and other international agencies and, of course, professors of forest economics throughout the world.

"Bob Gregory is a great applied classical economist who really believes that economic science, when hooked to real policy and development issues, can make a major difference in how people live. He communicated his belief and his enthusiasm to Michigan students for over thirty

years. This is why he attracted a remarkable group of graduate students, many of whom never intended to do doctorates in economics. He influenced virtually all of them, inspired several to fruitful careers, and made all the rest of us who were near him a bit better. That is as much as any true academician can aspire to," wrote Bentley.

As an adviser, Gregory set high standards, lessons that his students remembered years later. "He pushed me to do my best. At the time I did not know the difference between a Masters in Science, which required a thesis, and a Masters in Forestry, which did not. Under his direction, I wrote a thesis for a Masters in Forestry. Later I learned that other faculty did not have such standards," said Stier.

Another student added, "I served as Bob's TA. My job was to take the exercises of the course and put in new numbers. One time I put in numbers that made a problem unsolvable. When some of the graduate students pointed this out, I reported to Bob. I expected him to crucify me. He was very calm and relaxed. He said I could have time at the next class to explain my mistake. Although it was humiliating this was absolute the best way to handle the situation. I never made a mistake like that again."

In addition to direct student advising, Gregory was the dominant figure in developing the graduate program in Forest and Natural Resource Economics at the University of Michigan,

⁷ That is, none of the 30 masters students identified in the 1983 report of the Pack Professorship, completed a Ph.D. under Gregory's direction. However, many of the Ph.D. students listed, completed masters degrees under his direction, while working towards a Ph.D.

which was a powerful and important program under his leadership. His research and the training upon which he insisted, insured the credibility of the program. Students uniformly report that Gregory encouraged them to take good courses, form strong committees and attack important empirical research questions. Gregory also gave students the freedom to use and develop their own ideas and abilities. However, in the words of his students, it is clear that his most profound influence was helping students on more personal levels:

"Bob was a very supportive individual. I had misgivings about my own abilities. Bob gave me the confidence to be Bill Banzhaf. He made a difference in my life."

Banzhaf

"Bob Gregory was a life shaping force. I wanted to be like him. He was one of the few forest economists in the country, the Head of Forestry at FAO came to visit Bob, and he was writing the standard text."

Whaley

Students repeatedly recalled having dinner with Bob and Ann Gregory, and their three children Bonnie, Robin⁸ and Sherry. "Graduate students became a member of his family. I knew his wife and kids well. I was always welcome at his home," said Lindell.

Rockwell recalled another aspect of Gregory's advising, "I

would go see him, and want to get things done in a hurry. He would force me to sit down and have a civilized conversation. I think he wanted to make sure that I had social graces."

Several students also report being inspired by Gregory's personal integrity, his devotion to his family and his struggles to overcome midlife health difficulties — including heart problems and a severe eye injury — to continue his work. For example in 1963, despite considerable pressure not to, Gregory testified at U.S. Congressional hearings against capital gains tax reductions for forestry operations.⁹ This testimony resulted in U.S. industry deciding not to offer Gregory any consulting opportunities. Students found inspiration in that Gregory was not bitter over this break with industry.

Gregory still advises. To us, he offers two observations regarding the future directions of forestry and forest economics:

"Forestry is waking up to the future. On many forests recreation is more valuable than timber production. The forestry profession is beginning to realize this."

"Forest economists should study how economics applies to people, not merely to forests."

⁸ Today, Robin is a well-known environmental economist.

⁹ U.S. timber production was eligible for capital gains treatment between 1944 and 1986.

REFERENCES

- Gregory, G. R., 1955. An Economic Approach to Multiple Use. *Forest Science*, 1(1), 6–13.
- Gregory, G. R., 1972. *Forest Resource Economics* (New York: John Wiley & Sons).
- Gregory, G. R., 1983. *Report on Pack Professorship*. Mimeo, School of Natural Resources and the Environment, University of Michigan, Ann Arbor, MI, USA.
- Gregory, G. R., 1987. *Resource Economics for Foresters* (New York: John Wiley & Sons).