

RESEARCH WORK UNIT DESCRIPTION Ref: FSM 4070	1. Number SE-4901	2. Station Southeastern Forest Exp Station
	3. Unit Location Athens, Georgia 30602-2044	

4. Research Work Unit Title
 Assessing Trends, Values, and Rural Community Benefits from Outdoor Recreation and Wilderness in Forest Ecosystems

5. Project Leader (Name and address)
 H. K. Cordell, Forestry Sciences Laboratory, 320 Green Street, Athens, Georgia 30602-2044

6. Area of Research Applicability National and Regional	7. Estimated Duration 5 years
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8. Mission
 Apply research theory and methodology to assessments of outdoor recreation and wilderness, with emphasis on supply-and-demand trends, economic values, and benefits to rural communities.

9. Justification and Problem Selection

Forest, natural resource, and ecosystem management decisions are becoming increasingly complex and often controversial as previously unrecognized or little recognized factors gain in social importance. While the production and extraction of market commodities, like timber, minerals, and grazing, continue to be important, society increasingly demands that more attention be given to noncommodity outputs such as diverse, high-quality recreation opportunities, wildlife habitat, and protected wilderness. The recent adoption by the Forest Service of Ecosystem Management as the agency's guiding philosophy is testimony that a more holistic approach to resource management is needed, and intended, in order to sustain the long-term productivity of forest resources and ecosystems in the face of an increasingly diverse mix of demands. To facilitate this more holistic ecosystem management approach, decision makers need high quality, science-based information, plus proven analytical tools, qualitative as well as quantitative.

Selecting the optimal strategy for implementing multidimensional resource and ecosystem management requires an understanding of the various challenges and dilemmas associated with potential strategies. Among the challenges facing resource managers are expanding markets for outdoor recreation, a growing system of protected wilderness, and an increasing awareness and appreciation of the amenity values of this nation's natural resources. Expanding markets in outdoor recreation offer the Forest Service and other resource management agencies one of their

10. Approach to Problem Solution (Start at conclusion of item 9.)

Signature	Title	Date
Recommended:	Assistant Director for Research	
	Assistant to Staff Director	
	Staff Director	
Approved:	Station Director	
Concurred:	Deputy Chief for Research	

challenges, but also a significant dilemma. The challenge is to provide a greater number of the recreation settings, facilities, and services increasingly in demand by a diversifying American public and to maintain or improve upon the existing quality levels of these opportunities. The challenge is to provide the most appropriate opportunities in a manner that is harmonious with ecosystem health and the social and economic health of resource dependent rural communities. The expanding National Wilderness Preservation System also offers many challenges. Foremost is the need to balance wilderness preservation management with the societal demand for outdoor recreation as well as maintaining the social and economic vitality of nearby, resource dependent economies.

Given our finite natural resource base, providing adequate outdoor recreation opportunities and protecting wilderness to meet the increasingly diverse and growing demands by society requires periodic, comprehensive assessments of demand and supply situations and predictions of likely futures. Since 1981, RWU SE-4901 has been assigned the responsibility for conducting the Renewable Resources Planning Act (RPA) Assessment of Outdoor Recreation and Wilderness. While significant advances in data, analytical approaches and modeling have been made; there is a continued need to assess the long-term recreation and wilderness trends and the social and resource factors driving these trends (Problem 1).

History has demonstrated that markets provide information and signals, which guide production and allocation of most goods and services in society in a relatively efficient manner. Benefits for most goods and services are captured through private ownership. Market prices convey individual and societal values for such goods and services. Such values assist and direct the production and distribution of goods and services. However, for certain natural resources and systems, such as wilderness and wildlands, wetlands, and threatened and endangered species, the market alone is incapable of providing quality information upon which allocation and distribution decisions can be based.

It is becoming increasingly apparent that publicly held natural resource systems such as forests, wildernesses, and water bodies provide society with a rich and diverse bundle of amenity benefits. It is also apparent that these natural resource systems are finite and face considerable pressure from the demands of an ever-growing and diverse population base. In order to face these increasing demands and provide for societal needs in an optimal fashion, public servants and resource managers must be equipped with quality information to supplement market information on individual and societal values and benefits derivable from our natural resource base. Therefore, we need to better understand the social and economic amenity benefits of natural resource systems (Problem 2).

As attested by both the Enhancing Rural America initiative and the America The Beautiful program, an important goal in Forest Service management is to provide benefits to residents of communities near National Forests. These benefits include economic stability and diversity, improved infrastructure and environmental services, and sustained gains in residents' quality of life. However, there are large knowledge gaps regarding the linkages between resource management and most of these benefits, particularly so for recreation and wilderness. Therefore, there is strong need to improve our understanding about the consequences and impacts of natural resource management on the economy and social fabric of resource dependent rural communities (Problem 3).

Many groups and individuals will benefit from successful research in each of the three aforementioned problem areas. A better understanding of long-term trends in recreation and wilderness is imperative to guide long-term management decisions for public and private sector recreation resources. Information obtained from successful applied research in Problem 1 will be particularly useful to legislative advisors, public and private resource land managers, forest and recreation planners, and to various elements of private industry related to recreation.

A more complete understanding of nonmarket and amenity benefits of our public and private lands is necessary to better manage our natural resource base. Applied research uncovering nonmarket use and nonuse values related to national forests, wildlands, and wilderness (Problem 2) will provide private and public administrators, environmental groups, forest and recreation planners, and the public at large with a better information base upon which to address short- and long-term allocation and distribution issues.

Many of our forests and wildlands are integrally linked to the socioeconomic fabric of rural communities. Thus, better understanding of the linkages and impacts, both social and economic, of management and policy changes on national forests and wildlands is essential to protecting and improving the quality of life in rural America. Applied research in Problem 3 will provide important information to federal, state, and local governments, forest planners, and the public at large, to facilitate decisions necessary to improving rural America.

Finally, basic research across the Unit's three problem areas should contribute to the advancement of theory and methods in social science. In doing so, the work will benefit both government scientists as well as the university academic community within both domestic and international institutions.

10. APPROACH TO PROBLEM SOLUTION

Problem 1: There is inadequate knowledge about long-term recreation and wilderness trends and the social and resource factors driving these trends.

RPA assessments of outdoor recreation and wilderness have become more widely known. Customers have expressed a wide variety of research needs. In general these needs focus on greater geographic resolution for demand and supply analyses; stronger linkages with other resource management, planning and policy processes; and improved theoretical grounding and methodological approaches. Past assessments have in part been based on broad and nonspecific data and sometimes on ad hoc approaches. Future assessments must be more focused, better grounded in theory, and more efficient.

It is imperative that research be conducted to continue to improve the science and technology for assessing present outdoor recreation and wilderness conditions, demands, and trends in each, and to provide a greater degree of insight into possible future conditions and issues. Research will be undertaken to improve the RPA Assessment's capability to provide descriptions that are nationally, regionally, and locally sensitive and analyses that meet the variety of needs of public and private resource managers. Improvements in the outdoor recreation and wilderness assessment and its supporting technology will seek to integrate recent advances in social theories and technological advances in social sciences, measures, equipment, and modeling. The approaches will provide information and analytical capacity for both broad policy and programmatic decisions as well as more specific issue analyses.

Societal trends in preferences and demographics will be measured and monitored to assess their effects on future demands. This is particularly important to meet the timing requirements of the RPA mandate and the forest planning and implementation processes.

Existing preference and satisfaction revelation models will require refinement, especially with respect to temporal stability. New technologies such as neural networks must be tested and compared to conventional time-series methods in the context of forecasting recreation and noncommodity demands on our ecosystems.

Accomplishments planned for the next 5 years:

1. Improve theoretical basis and develop an applicable framework for linking the various levels of assessment, planning, management, and policy processes.
2. Develop better measures of resource supply on outdoor recreation and wilderness and improve capability to assess current and future trends.
3. Develop better methods for describing demand and consumption trends for outdoor recreation and wilderness, and for understanding the values of wilderness.
4. Improve understanding of the factors driving trends in outdoor recreation and wilderness demand and supply.
5. Identify social, economic and environmental attributes that may be affected by future trends in outdoor recreation and wilderness use.
6. Provide guidelines and techniques for applying assessment results to policy, planning, and management decisions at national, regional and local levels.

Environmental Consideration: Research in this problem area is conducted in an office environment, is expected to have no impact on soil stability, water quality, or sensitive resource values, and is therefore covered under FSH 1909.15 Section 31.1 categorical exclusion as outlined in the WO Amendment dated September 21, 1992. If a particular study does involve field work, environmental concerns will be evaluated within individual study plans. If needed, Environmental Assessments or Environmental Impact Statements will be prepared with and approved by cooperating District or Forest staffs.

Problem 2: To better understand the social and economic amenity benefits of natural resource systems.

The types of amenity benefits that need to be better identified and understood include: (a) on-site consumptive and nonconsumptive use benefits, (b) off-site indirect consumptive and nonconsumptive use benefits, and (c) nonuse benefits. On-site consumptive use benefits include such things as fish and wildlife harvest for recreation and subsistence, and harvesting noncommercial plant species such as berries and herbs. On-site nonconsumptive use benefits derive from a myriad of recreation activities such as hiking, wildlife viewing, boating, and motor touring as well as providing for educational and scientific activities. Examples of indirect use benefits include providing habitat for migrating animal species, water filtration, and air purification. Finally, the most intangible and least understood of the benefits are those falling into the nonuse class. Examples include spiritual, intrinsic, and altruistic benefits derived from preservation natural systems like wilderness and wetlands.

A substantial gap in our knowledge base persists with respect to the conceptualization, identification, and assessment, both qualitative and quantitative, of amenity benefits provided by our national forests and related natural resource base. Basic and applied research is necessary to close this gap.

Basic research must be conducted to better evaluate and identify the theoretical and conceptual basis of human values and preferences pertaining to environmental choice where complex conflicts exist. This includes work examining ethnic and cultural dimensions. Basic research must also be conducted in the area of theoretical and statistical modeling of value and preference structures in humans and understanding the linkages between preferences, choice, and well-being. Current nonmarket methods provide considerable advances over those used in years past; however, our knowledge in these areas is still very primitive.

Applied research is needed to supplement ongoing management decisions and to examine specific policies with respect to societal benefits and opportunity costs. Applied research is also necessary to establish an information base containing benefits estimates for use in benefits transfer cases and to field test advancements in state-of-the-art valuation methods. Additional applied research is necessary which focuses on integrating noneconomic, cultural, and community preferences into a viable decision framework for resource allocation.

Accomplishments planned for the next 5 years:

1. Develop and refine nonmarket methods for quantifying benefits of natural resource systems such as forests, wilderness areas, and water bodies.
2. Identify means to incorporate individual and societal benefits into management activities and decisions.
3. Provide information on value and benefit perceptions of natural resource systems across social strata based on ethnicity, religion, occupation, education, race, age, income, and sex.
4. Develop an information base suitable for benefits transfer problems.
5. Identify and examine possible applications of user fees for recreation activities on public lands.
6. Develop and examine techniques for combining market and nonmarket value information into a decision making framework.
7. Examine culturally-based choices and preferences pertaining to outdoor recreation and natural resource use.

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Problem 3: There is inadequate knowledge about the consequences and impacts of natural resource management and uses on the economy and social fabric of forest-dependent, rural communities.

Four general areas of research have been identified for this problem. First, research is needed to identify and classify rural residents' values and uses of wilderness areas, the National Forests, and the larger landscapes of which these Forests are a part. It is necessary to understand these values and uses in order to have management policies that respond to the needs and desires of these residents and improve their quality of life. Particular attention needs to be paid to residents' perceptions about the contribution of designated wilderness areas and of the National Forests to economic opportunities and quality of life, the importance of commodity and non-commodity outputs, the sustainability of current levels of outputs, and the ecological health of the Forests.

Second, existing models that describe and predict the economic impacts of recreation visitation on surrounding communities are incomplete. Notably absent is research regarding impacts of recreation on specially designated areas including wild and scenic rivers, wilderness areas, and scenic byways. In addition, techniques used to assess secondary economic impacts of recreation visitation to such areas need to be improved, to account for the contribution of recreation development and special designations to both growth and shifts in local economic structure.

Various bodies of literature have indicated that the type and amount of purchases made by recreation visitors depend on a wide variety of variables, including some or all of the following: recreation activity, trip length, site quality, economic structure of purchase opportunities, and visitor's income. These issues are important because secondary economic impacts of recreation depend on the amount and location of visitor purchases. The third area of needed research is to develop models of visitor purchases in a local economy. These models will enable planners to estimate economic impacts of planned recreation developments or of expected visitor demands in newly designated special areas (such as wilderness) on local economies.

Fourth, some research has indicated that increasing dependence on any one forest product may have negative consequences on local economies. Current methods for defining recreation dependency are inadequate. Little research has been conducted on the social, ecological, and economic characteristics of recreation dependent communities. Few studies have compared these characteristics of recreation dependent on other forest products. Such research is needed to understand the tradeoffs resulting from increased reliance on forest recreation as an industry, or from changes in the mix of forest outputs after an area has received special protection status (e.g., designation as wilderness).

Accomplishments planned for the next five years:

1. Identify social and environmental values held by residents of communities near National Forests and near Wilderness areas in the Southeastern U.S.
2. Improve the theory and techniques to assess the secondary economic impacts of recreation visitation on public lands and waters, including use of Wilderness Areas and Wild and Scenic Rivers.

3. Develop models of recreation and wilderness visitor purchases and examine the role of site quality, special designation, and economic structure in predicting visitor purchase amounts and patterns.
4. Improve definitions for recreation dependent communities. Identify recreation dependent areas around national forests and Wilderness areas, examine their economic and social characteristics, and compare these characteristics to those of communities dependent on other forest products.
5. Examine the relationship between public sector recreation and wilderness resources and private sector business opportunities.
6. Examine the impacts of designated wilderness areas and recreational resource development on local communities, their economic structure, and social indicators of quality of life.

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STAFFING

Permanent staffing needs are 1 Project Leader, 3 Ph.D.-level Scientists, 3 MS-level supporting Research Associates, and 2 Administrative Associates. The research program outlined here will require an average annual cost of \$750K. Expected distribution of SY's through the 5 year term will be as follows:

Current Personal Research Assignments:

Scientist	Problem 1	Problem 2	Problem 3
Cordell	0.80	0.10	0.10
English	0.15	0.15	0.70
Bowker	0.20	0.70	0.10
Sociologist	<u>0.20</u>	<u>0.30</u>	<u>0.50</u>
	1.35	1.25	1.40

Problem Area	Scientist Years per Years of RWUD				
	1	2	3	4	5
1	1.35	1.35	1.35	1.35	1.35
2	1.25	1.25	1.25	1.25	1.25
3	1.40	1.40	1.40	1.40	1.40
	4.0	4.0	4.0	4.0	4.0

Expected Cooperators:

A. Forest Service:

SE-4851 Economics of Forest Protection and Management
NE-4951 Forest Recreation and Investment Research
RM-4851 Valuation of Wildland Resource Benefits
SE-4103 Ecology and Management of Forested Wetland Ecosystems of the South Atlantic Coastal Plain
SE-4101 Ecology and Management of Southern Appalachian Hardwood Forests
SE-4201 Endangered, Threatened and Sensitive Wildlife in Southern Forests
INT-4901 Wilderness Unit
Aldo Leopold National Wilderness Institute
Southeastern Station Global Change Program
Recreation, Cultural Resources and Wilderness Management Staff, WO
Resources Program and Assessment Staff, WO

B. Outside Agencies and Institutions:

Florida A&M University
Georgia Southern University
University of Georgia (Institute of Behavioral Research, Survey Research Center, Department of Agricultural and Applied Economics and Department of Recreation and Leisure Studies)
Fort Valley State University
Clark Atlanta University
Virginia Polytechnic and State University
Colorado State University
Purdue University
National Oceanographic and Atmospheric Administration
Bureau of Land Management
Corps of Engineers
Tennessee Valley Authority
Soil Conservation Service, Resource Conservation Appraisal Staff, WO

C. SE-4901 has formed a formal partnership with the Department of Agricultural and Applied Economics in establishing the Environmental Resources Assessment Group. Through this group, ERAG, studies applying the advances and knowledge base from problems 1-3 are undertaken to address specific recreation, wilderness, and environmental issues.