

Grants Awarded by U.S. MAB for FY 1992

Community Involvement in Cooperative Resource Management: The Case of the Porcupine Caribou

The Porcupine Caribou Herd (PCH) is the largest shared mammalian resource of the United States and Canada and an important resource to over 9000 native and nonnative subsistence harvesters who live in communities within and just outside of the PCH's range. Such natural resources can pose special management problems that are often a result of the migratory nature of the resource, the jurisdictional coordination required in management, and the cultural disparity which is sometimes found between indigenous resource users and national government agencies.

In Canada, government and native Porcupine Caribou resource users have attempted to address these problems by entering into a "comanagement" agreement which calls for user communities and government agencies to share in the authority and responsibility for Porcupine Caribou management.

The objective for this research is to analyze and evaluate community involvement in caribou management decisionmaking, a critical component of Canada's approach to PCH management. The focus will be two PCH user communities which are closely tied to the resource for subsistence and cultural needs. The goal will be to determine to what extent and in what ways these local communities are actually involved in caribou management, what factors influence their participation, and how decisions relate to human-biosphere sustainability. The project will study how the implementation of this management arrangement has changed local decisionmaking, as well as document how community members evaluate community participation.

continued on page 2

EuroMAB Update—We're on our Way!

BRIM Initiates Test of Bioinventory Program

EuroMAB has begun to inventory the fauna and flora in its 166 biosphere reserves. The initial goal is to create a usable list of the vertebrate animal and vascular plant species that have been reported along with the important information that has been collected on each species. This is crucial before embarking on major efforts to expand collections. It will make effective use of existing data, identify serious existing gaps in information, aid in setting priorities for future monitoring efforts, and be immediately useful to reserve managers and scientists.

In order to identify and organize the information that they currently have, the Biosphere Reserves Integrated Monitoring Program (BRIM) created three EuroMAB system-wide data bases: the Biological Inventory Status (MABBIS) data base, the fauna (MABFAUNA) data base, and the flora (MABFLORA) data base. MABBIS describes the current status of biological inventories for vascular plants, mammals, birds, reptiles, amphibians, and fishes in terms of completeness for each biosphere reserve. The MABFAUNA and MABFLORA data bases contain species

continued on page 2

In This Issue

- **President-elect Clinton on National Science Policy**
- **MAB Videos**



listings and associated data for each biosphere reserve based on documented individual occurrences of animal and plant species in the biosphere reserves.

In order to initially test the operation of the BRIM Bioinventory and the construction of the data bases, U.S. MAB has sent to 10 participating EuroMAB BRIM coordinators: the EuroMAB Bioinventory, written instructions for creating the data bases, a 3 1/2" floppy disk containing the data bases, and instructions to enter information and complete the MABBIS and MABFAUNA data bases for the vertebrates of one biosphere reserve in their country. This information will be returned to Mike Ruggiero, Chief of the Wildlife and Vegetation Division of the National Park Service by December 31, 1992. This will enable us to evaluate its operation and make any changes or adjustments which may be required for effective data gathering and synthesis.



U.S. MAB BULLETIN

The U.S. MAB Bulletin is published quarterly by the U.S. MAB Secretariat, OES/EGC/MAB, Room 608, SA-37, U.S. Department of State, Washington, DC 20522-3706. Tel. 703-235-2946, 2947. FAX # 703-235-3002.

"The mission of the United States Man and the Biosphere Program (U.S. MAB) is to foster harmonious relationships between humans and the biosphere through an international program of policy-relevant research which integrates the social, physical, and biological sciences to address actual problems. These activities—broadly interpreted—include catalytic conferences and meetings, education and training, and the establishment and use of biosphere reserves as research and monitoring sites." Adopted by the U.S. National Committee for the Man and the Biosphere Program, January 6, 1989.

U.S. MAB is supported by the Department of Agriculture-Forest Service, the Department of Energy, the Department of the Interior-National Park Service, the Department of State, the Agency for International Development, the Environmental Protection Agency, the National Aeronautics and Space Administration, the National Oceanic and Atmospheric Administration, the National Science Foundation, the Peace Corps, and the Smithsonian Institution.

The program is organized into five directorates: High Latitude Ecosystems; Human Dominated Systems; Marine and Coastal Ecosystems; Temperate Ecosystems; and Tropical Ecosystems.

Researching the role of community in cooperative management arrangements represents a critical step in understanding the performance and success of authority-sharing agreements between government and indigenous peoples in the management of natural resources. Community involvement is the foundation on which this institutional design is based, and has direct implications for how local needs, traditional knowledge, and indigenous values translate into management outcomes. Understanding the potential role of communities in resource management systems will provide insights into whether and how this approach to wildlife management should be implemented in other areas.

Gary P. Kofinas—Principal Investigator
University of British Columbia
Vancouver, BC
Canada

Long-Term Sustainability of Atlantic White Cedar Swamps in the Pinelands Biosphere Reserve

Atlantic white cedar swamps are an important cultural and ecological component of the landscape of the Pinelands Biosphere Reserve. The area occupied by cedar has been declining for the last 300 years due primarily to conversion to other wetland vegetation as a result of both natural and human related disturbances. Agricultural activities and hydrologic changes associated with upland development also affect the ecological viability of Atlantic white cedar wetlands. Fragmentation of the once extensive swamps is of particular concern. Because of the historical significance of cedar as a timber resource, regulated harvesting is a permitted activity on both private and public lands within the Pinelands Biosphere Reserve.

The proposed research will define several ecological endpoints that reflect the past and present status of Atlantic white cedar wetlands in the Pinelands. The Commission's goal is to preserve and enhance this resource. Researchers will describe the temporal and geographic trends in the extent, size, and quality of Atlantic white cedar swamps and their spatial relationship to other landscape components; and the factors responsible for any observed changes.

A model for human interactions with Atlantic white cedar swamps will be developed within the context of a geographic information system (GIS). Several scenarios reflecting different institutional control pathways and transition probabilities will be developed, and the effect of each institutional control scenario on the ecological sustainability of Atlantic white cedar swamps will be

continued on page 3



Grants Awarded—continued from page 2

assessed. This will have direct application to natural resource management and environmental policy decision-making in the region.

Robert A. Zampella—Principal Investigator
Pinelands Commission
New Lisbon, New Jersey

Richard G. Lathrop—Principal Investigator
Department of Natural Resources
Cook College
Rutgers, the State University
New Brunswick, New Jersey

***Optimal Design of Marine Reserves:
Ecology and Economics***

The goal of this research is to outline an interdisciplinary framework for optimizing the design of marine reserves and to develop practical methods for implementation. While marine reserves have a number of uses, the project will focus on their role in the conservation of biological diversity as a measure of ecological sustainability. The design of marine reserves should be guided by an adequate conceptual framework incorporating ecological information such as the spatial distribution of species, physical information such as the scale of potential disturbances, and economic information such as the costs and benefits of alternative designs. The term “reserve design” is taken to mean both the location and the configuration of the reserve and the way in which the reserve would be managed, e.g., which activities in or near the reserve are allowed.

The study will emphasize the temporal and spatial dimensions of species populations and human impacts. More specifically, it will:

- 1) identify the conservation implications of dispersal and flow characteristics of marine systems;
- 2) compare biological, disturbance, and management scales; and
- 3) translate these considerations and comparisons into guidelines for reserve design and further research needs.

The research will proceed in two phases. In the first phase, the elements of an ecological basis and economic basis for designing marine reserves will be laid out and practical methods for implementation will be developed. In the second phase, the two elements will be combined into a comprehensive framework for reserve design. This framework will then be applied to a specific case study involving the Channel Islands Biosphere Reserve site.

It will attempt to answer such questions as: What degree of protection can marine reserves actually provide? Can they serve other functions such as fisheries enhancement, recreation, research, and education? How does the design of a reserve relate to its effectiveness in achieving these goals? What additional management measures are needed?

Andrew R. Solow — Principal Investigator
Woods Hole Oceanographic Institution
Woods Hole, Massachusetts

Patricia M. Mace — Principal Investigator
University of California at Berkeley
Berkeley, California

Causes and Consequences of Land-use Decisions in Two Adjacent Drainage Basins in the Central Oregon Cascade Range

The goal of this study, through a comparison of land-use patterns in two adjacent drainage basins on the west slope of the Cascade Mountains of Western Oregon, is to develop a methodology for better understanding the interactions among social and ecological factors as they influence, and are influenced by, land-use decisions and management practices in forestry and agriculture. Specific objectives are:

- 1) to understand how human communities and interest groups interact with ecological attributes of these drainage basins to influence land-use decisions;
- 2) to understand how social network and urban-core/periphery relationships influence such decision-making; and
- 3) to determine how land-use decisions, in turn, affect ecosystem properties in rural and forested areas, particularly carbon stores and net CO₂ flux to the atmosphere.

The study area that has been selected is in the heart of current regional and national controversies about land-use and natural resource management, and its subdrainages reflect conflicting demands for resource conservation and resource development. The two adjacent drainage basins share a common climate, soils and native vegetation, but differ in physical setting and social history. The effects of differences in physical setting will be traced, through effects on settlement patterns, transport routes, and land ownership, to the differences in land-use decision making that we see today. They will reconstruct past and current land-use patterns on the two drainage basins from satellite imagery, aerial photos, census and agency records, etc. A GIS will integrate the social and ecological data.

continued on page 4



Optimal Design—continued from page 3

The long-term product of this research will be a methodology for projecting the consequences of changes in land use, social and economic structures, and ecosystem properties and behavior on future use and productivity of the land. By focusing on integrating social and ecological disciplines on a small but representative portion of the Pacific Northwest ecoregion, the researchers seek to improve the long-term management of the temperate ecosystem landscape for biodiversity, productivity, and stability.

Steven Radosevich and Phillip Sollins —
Principal Investigators
Department of Forest Science
Oregon State University
Corvallis, Oregon

Tree Growth and Regeneration in Quintana Roo (Mexico): Implications for Sustainable Forestry and Biodiversity

This research will focus on a 5-year interdisciplinary project on sustainable forestry in tropical dry forests in Quintana Roo, Mexico. It will help to implement and evaluate an existing forest management program. Data on tree growth and regeneration will improve a computer-based model that was developed to plan tree cutting rotations. The researchers will also evaluate the impacts of sustainable forestry on the local avifauna.

The four primary objectives of this project are:

- 1) to quantify species specific growth rates of commercially important tree species, with an emphasis on the influence of soil type and between-year differences in rainfall;
- 2) to quantify natural regeneration of commercially important species with an emphasis on seed production and seedling establishment, survival and growth;

- 3) to evaluate the use of a silvicultural treatment to enhance the representation and growth of commercially important species through the use of cutting and herbicides to remove noncommercial species from the vicinity of desirable trees; and
- 4) to evaluate the effects of selective logging on the occurrence and relative abundance of resident and migratory birds before and after logging activity by mist-netting and point counts.

As a result of the existing forest management program, tree products from the Nohbec ejido have been certified by conservation groups, and lumber is now being exported to specialty markets in the United States and Europe. However, the long-term success of the Plan Piloto Forestal (PPF), the forest management program, hinges on the availability of reliable data on tree growth rates, data on the regeneration requirements of economically important species, and an assessment of the logging impacts on forest dependent animal species, including endangered migratory birds.

This research was urgently requested by the Plan Piloto Forestal managers because previous research in northeastern Quintana Roo has shown that tree growth rates there are much lower than rates currently used in the PPF growth model; growth rates vary widely among tree species; and between-year differences in growth rates are very high.

The research team is interdisciplinary and includes Mexican and U.S. botanists, forest ecologists, plant ecologists, animal ecologists, foresters, and computer experts.

Dennis F. Whigham and James F. Lynch —
Principal Investigators
Smithsonian Environmental Research Center
Edgewater, Maryland 21027

Felipe Sanchez Roman
A.P. 1191
Cancun, Q.R. Mexico 77500

continue on page 5



President-elect Clinton's Views on Science Policy

President-elect Bill Clinton responded to questions on a number of science policy issues posed by Daniel E. Koshland, Jr., editor of Science Magazine, in the Policy Forum section of its October 16th issue. The following is reprinted with their permission from that issue of Science.

Question 1: How important do you think basic science is for our country in general, or specifically, in areas such as improving health, preventing pollution of the environment, and the creation of jobs? Do you think appropriations for science should be increased, decreased, or kept level?

A. Our stress on basic science research has been, and continues to be, important for the United States. Our science policy since the end of World War II has paid tremendous dividends for the nation. It has made the United States a world leader in science; has made America's university education and research system the best in the world; has allowed us to supply ourselves and other nations with skilled scientists and engineers; and has made it possible to provide technology to academia, industry, and the government on a scale that no single company or laboratory could have accomplished alone.

Today, the federal government provides the bulk of all basic research funding for U.S. researchers. I have called for increases in funding for both AIDS-specific and general biomedical research and have pledged to reinvest every dollar cut from defense R & D into civilian research and generic technology development.

Question 2: What is your position on "big science" versus "little science"? Specifically, would you increase or decrease the appropriations for each of the following: the space station, the supercollider, the genome project, the National Institutes of Health, the National Science Foundation?

A. Both kinds of research are vital; I do not accept the view that one must be sacrificed in order to sustain the other. A continued high level of support for research performed by individual researchers and small teams will be a priority—this type of research is the source of most new discoveries and innovations. Some types of research, however, can only be done in large facilities or by large groups of researchers and technicians. I support the space station, the supercollider, and research into shortcuts to map the human genome, but under current economic conditions, it only makes sense for nations to share the costs of the very large and costly science projects which ultimately benefit

all people and nations. I would make sure that appropriations for the National Institutes of Health and the National Science Foundation at least keep pace with inflation and be increased further as soon as budgetary conditions permit.

Question 3: There has been a shift in criteria for funding basic research at NSF and NIH toward emphasis on the possibility of creating U.S. jobs—that is, national competitiveness. Would you favor that as a criterion for research funds? How would you implement criteria that would set that objective?

A. The National Science Foundation and the National Institutes of Health are internationally renowned and emulated for their high quality support of the best basic research in the world. This support for basic research must be sustained and strengthened.

The linkages between basic research and technology development are becoming increasingly prevalent. The absence of a coherent technology policy is one of the key reasons why America is trailing some of its major competitors in translating its strength in basic research into commercial success. My technology policy picks up where our science policy leaves off. Under a Clinton-Gore Administration, the criteria for NSF and NIH funding of research—excellence and merit—will not change. More attention will be paid to making the results of that research, where possible relevant and quickly available to the development of technologies by industry.

Question 4: Would you favor giving EPA a research capability on environmental matters similar to NIH's research capabilities on medical matters?

A. We cannot protect the environment or public health in a cost-effective way if EPA's regulations are not based upon high-quality science. William Reilly, the present EPA administrator, has made a concerted effort to put EPA's environmental protection strategy on a firm scientific foundation, but he has not received adequate support from the present Administration. There is a clear need for expanding environmental research programs, but we cannot expect a single agency to be responsible for addressing every environmental problem. Consider just one environmental problem: global warming. More than 10 agencies, including NASA, the National Oceanic and Atmospheric Administration, and the National Science Foundation, contribute to the U.S. Global Change Research Program because no single agency could collect and analyze the variety of data needed to understand the problem. In addition, almost as many agencies are doing research on

continued on page 6



President-elect—continued from page 5

ways to address the problem. We can, however, do a much better job of ensuring that other agencies work more closely with EPA.

Question 5: What are your feelings about the biodiversity treaty of the Rio summit? What, in general, is your attitude toward international patent rights?

A. Today, species are becoming extinct at more than a thousand times the historic rate and the pace is accelerating. Entire ecosystems are disappearing. I believe that we missed a great opportunity at the Rio Earth Summit last June to exert international leadership on this issue and a host of other global environmental issues. Rather than opposing the efforts made there by many other countries, we should have helped shape, and then signed, the Bio-Diversity, Earth Charter, Agenda 21, the Forest Principles, and Climate Change Conventions—and, in so doing, conveyed our commitment to a world in which each nation's environmental performance is the concern of its neighbors.

With true U.S. leadership, we could have negotiated an effective treaty that would have both preserved the planet's biodiversity and protected the intellectual property rights of U.S. companies. As the country with the largest store of national wealth in patented technology, we lost an opportunity to take an active role in shaping international law for the protection of patents, copyrights, and technological advances.

Question 6: Do you expect to make changes in the White House science policy apparatus? In particular, will your science adviser remain at the level of Assistant to the President? Will your science adviser be involved in the selection of officials in top science posts in your Administration?

A. I have made a pledge to the American people to "reinvent" government—to make it more responsive to their needs and to the challenges of a rapidly changing social and economic environment. In this context, my science adviser will play a more critical role in overall government policymaking than ever before. I expect that the science adviser will play a role not only in determining policy but also in advising on the selection of top officials

who will have science and technology responsibilities. In addition, I have stated on a number of occasions that I will give Vice President Al Gore the responsibility and authority to coordinate our overall technology, and by extension, science policy across all government agencies. Finally, the science adviser will have full access to the Vice President and me in the role of Assistant to the President.

Question 7: What specific steps will you take to improve science education in grades K through 12? For example, should science requirements be increased in high school?

A. To encourage students to choose study in the demanding fields of science, math, and engineering, we need to ensure not only that they arrive at college academically prepared but also that they have some assurance that jobs in these fields will be available for them upon graduation. It is no accident that improvements in K through 12 education are an important part of the National Economic Strategy that I have proposed for this country.

My commitment to educational reform can best be seen by my record as governor of the state of Arkansas. One component of this reform was to add more math and science courses to high schools and seek improvement in math and reading test scores. In the past decade we have made great strides. While only 5,100 students were enrolled in advanced math courses in 1983, over 75,000 were enrolled in 1991. While the percentage of Arkansas seniors who went on to attend an Arkansas college was under 38.2% in 1982, this percentage had increased to 51.3% by 1991. In addition, Arkansas now ranks fifth in the nation in the ratio of computers to students in schools.

In the first 100 days of a Clinton-Gore Administration, we'll give Congress and the American people a real educational reform package. This package would include fully funding Head Start and other programs; establishing tough national standards and a national examination system to measure if those standards are met.; and working to achieve the 1989 Education Summit's "National Education Goals" by the year 2000—one of these goals being that students should be knowledgeable about math, science, language, history, and geography when they graduate from high school.



MAB VIDEOS For Sale and Rent

Biosphere Reserves in Tropical America

A Documentary produced by UNESCO and Conservation International.

From the brochure:

“Most of what we hear about the environment these days is the unwelcome news that in the struggle between people and nature, nature is losing. Now . . . UNESCO and Conservation International (CI) have produced a documentary showing that we can fulfill the economic needs of people and still protect the earth’s ecosystems.

In *Biosphere Reserves in Tropical America*, CI producers Haroldo and Flavia Castro focus on one solution—the biosphere reserve—that seeks to unite people and nature . . . [T]hey escort the viewers through five biosphere reserves and show—though the people who live and work there—that communities can reconcile their needs with conservation.”

Biosphere Reserves in Tropical America costs \$14.95 plus \$3.50 for handling and shipping. Make checks payable to Conservation International. Outside the U.S. money orders only and an additional \$2.00 for shipping. Order from: Conservation International, 1015 18th Street NW, Suite 1000, Washington, D.C. 20036.

Man and the Biosphere Series

This series of 12 videos was produced by a French film company in cooperation with UNESCO. The videos are being distributed by Films for the Humanities and Sciences of Princeton, New Jersey. This video series is recommended by *The Science Teacher*.

From the brochure:

“Based on UNESCO’s wide-ranging project, *Man and the Biosphere*, this major series looks at the interrelationship of human beings and the places they inhabit—mountains, forests, deserts, shorelines, cities. It shows how all life adapts to its physical

surroundings and examines the effects of burgeoning populations on those surroundings. The importance of the programs derives from their exhaustive global perspective and from their emphasis on the simple truth that no environmental policy can be effective without the cooperation of the population most immediately affected, for those on whom it falls most heavily are invariably those who can least afford to pay.

The series looks at the relationships between living beings and their nonliving environment and between humans and the rest of the environment. Biologists, botanists, geologists, and demographers examine ecological concerns in the face of political realities. The series . . . illustrates the problems and concerns of preserving life on earth and demonstrates numerous environmental projects that have successfully met the need of both humans and nature.”

The videos cost \$149 each to purchase and \$75 per rental. The series includes:

- Life in Arid and Semi-Arid Lands
- The Desert as Laboratory
- Equilibrium in a Mountain Habitat
- The Tropical Rain Forest
- Preserving the Rain Forest
- Coastlines
- Lagoons
- Wetlands and Pinelands
- Urban Ecology
- Toward a Liveable City

For more information write:

Films for the Humanities and Science
P.O. Box 2053
Princeton, N.J. 08543
Tel: 1-800-257-5125; FAX: 1-609-452-1602



U.S. Man and the Biosphere Program, OES/EGC/MAB

DEPARTMENT OF STATE, U.S.A.
Washington, DC 20522-3706

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, \$300

DEPARTMENT OF STATE PUBLICATION 9973
Bureau of Oceans and International Environmental
and Scientific Affairs

Released November 1992



Printed on Recycled Paper