

U. S. BIOSPHERE RESERVE MANAGERS' WORKSHOP

October 29-31, 1995

Hyatt Dulles Hotel
Herndon, Virginia

WORKSHOP REPORT

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BACKGROUND AND APPROACH

In December 1993, the U.S. Man and the Biosphere Program convened a national workshop of the managers of U.S. Biosphere Reserves to make recommendations for developing the U.S. Biosphere Program. A special committee of biosphere reserve managers used the workshop recommendations to prepare a Strategic Plan for the U.S. Biosphere Reserve Program (USBRP). The plan sets forth the program's mission, six goals, nine objectives, and 44 actions to be substantially implemented during the next decade. The Plan was approved by the U.S. National Committee for the Man and the Biosphere Program (U.S. MAB) in July, 1994. In accordance with the Plan, the Committee immediately established a Biosphere Reserve Directorate to oversee and coordinate the USBRP. In its initial proposals to U.S. MAB, the Directorate called for another managers' workshop to obtain the perspectives and recommendations of biosphere reserve managers for implementing the Plan, and to bring managers up to date on significant developments in the Biosphere Reserve Program at the local, national, and international levels. An ancillary objective was to recommend ways to better integrate all components of the U.S. Man and the Biosphere Program with U.S. biosphere reserves.

___ individuals attended the workshop, including representatives from ___ of the 47 U.S. Biosphere Reserves (and ___ of the 99 administrative sites in these reserves) and biosphere reserve programs of Canada, Mexico, Germany, and Russia (see Directory of Participants, Attachment A). The workshop agenda (Attachment B) consisted of plenary sessions on the first day to review ongoing U.S. MAB activities and recent developments in U.S. biosphere reserves, and a series of work group sessions on the second day to develop recommendations on particular topics.

OPENING PLENARY SESSION

In his opening remarks, U.S. MAB National Committee Chairman Dean Bibles reviewed the report of a special ad hoc commission (the Constable Commission) he established in 1994 to review the status of MAB and recommend future directions. The report, accepted by U.S. MAB in July 1995, recommend that U.S. MAB's near-term goal should be to establish innovative institutional arrangements that foster local partnerships to enhance conservation and sustainable use of natural resources. As permanent sites for encouraging MAB activities, biosphere reserves play an essential role in achieving the goal. However, the Commission stressed that MAB activities must extend beyond the boundaries of designated biosphere reserve sites to help interested stakeholders address broader regional issues of ecosystem management. To implement the Commission's recommendations, Bibles indicated that U.S. MAB will expand the efforts to implement the Strategic Plan for the U.S. Biosphere

Reserve Program, approved in 1994, and to develop "serious support" for MAB. At the national level, U.S. MAB will continue to work closely with funding agencies to integrate MAB more fully with their missions. The Chairman will establish a MAB forum to consider ways to strengthen public and private participation. At the regional level, U.S. MAB will actively encourage and support the efforts of biosphere reserve managers to develop partnerships with agencies and private sector, and to involve local citizens, in implementing MAB goals in particular ecosystems.

Bibles noted that many protected areas and groups are working to demonstrate cooperative approaches consistent with the goals of the Strategic Plan. However, the participants in these efforts may not presently wish to petition for biosphere reserve designation by UNESCO, or may not be able to prepare a biosphere reserve nomination that fully meets UNESCO criteria. U.S. MAB could nevertheless play an important role in recognizing and facilitating local efforts to implement biosphere reserve goals. To explore this opportunity, the Chairman asked the Biosphere Reserve Directorate to prepare recommendations for the establishing the special designation of U.S. Biosphere Reserve. The new designation would be awarded by U.S. MAB to recognize the role of sites in implementing the biosphere reserve concept.

Roger Soles, Executive Secretary of the U.S. MAB Program, briefly reviewed recent international developments. In November, the UNESCO General Conference is expected to approve a strategy for developing effective biosphere reserves, and a Statutory Framework for the World Network of Biosphere Reserves 1/. These documents provide useful guidance for selecting biosphere reserves, developing the roles of biosphere reserves in conservation and as models of ecosystem management and sustainable development, strengthening the scientific and educational uses of biosphere reserves, and building a functional world network for cooperation. Soles emphasized the importance of the new guidance in encouraging local participation in biosphere reserves and monitoring the status of efforts to implement biosphere reserve functions through periodic review and reporting by concerned authorities.

Soles reviewed recent accomplishments in international efforts to improve access to information and data from biosphere reserves. As a partner in EuroMAB's Biosphere Reserve Integrated Monitoring Program (BRIM), U.S. MAB provided technical assistance in developing the "ACCESS" directory of basic information on 175 biosphere reserves in the U.S., Canada, and 30 European countries; published the directory" in 1994 and made it available on the Internet. The compilation includes information on contacts, available resource data, research topics, and site support. In 1995, the UNESCO MAB Secretariat expanded the Directory to include the remaining biosphere reserves in the World Network. A related EuroMAB initiative involves the compilation of MABFauna and MABFlora metadatabases on biological inventories in biosphere reserves. The databases, which includes species lists and related information, use a protocol originally developed for U.S. National

Parks. With technical support from the National Biological Service and the University of California at Davis (UCD), U.S. MAB coordinated the testing of protocol in Europe and initial development of electronic databases for a number of biosphere reserves, using records for birds. UCD is serving the reserves' MABFauna databases on the Internet and is providing technical assistance to enable countries and biosphere reserves to assume this function. Finally, MAB-Germany is coordinating development of a metadatabase on data collected in permanent plots in EuroMAB biosphere reserves. To date, data have been received from 77 biosphere reserves in 22 countries. U.S. MAB has agreed to publish the Directory in the ACESSS series in early 1996. U.S. biosphere reserves that have not yet responded to previous U.S. MAB requests should information on their plot data immediately to the MAB Secretariat.

In cooperation with the Smithsonian Institution, CYTED (Ciencias y Tecnologia para el Desarrollo), and other MAB organizations in the Western Hemisphere, U.S. MAB is supporting development of MABNetAmericas as an integrated framework for sharing data and experience among the Hemisphere's 100 biosphere reserves, using the protocols for ACCESS and MAB Fauna, and a protocol for plot-based monitoring developed through the Smithsonian/MAB Biodiversity Program (SI/MAB). In May 1995, U.S. MAB and the Smithsonian hosted representatives from _____ countries to recommend goals and operational requirements for MABNetAmericas. A follow-up meeting is scheduled in January in Costa Rica to develop a proposed pilot project and funding strategy for implementing the protocols and electronic communication capabilities in several biosphere reserves.

Michael Ruggiero, Chief of the Division of Ecosystem Inventory and Assessment at the National Biological Service, discussed an interagency initiative being coordinated through the Office of Science and Technology Policy, to develop a national framework for integrating environmental monitoring from remote sensing, surveys, and sites. The project has so far obtained information on about 13,000 monitoring sites, many of which are within designated biosphere reserve sites or in the surrounding zones of cooperation. Ruggiero stressed the importance of biosphere reserves in demonstrating ways to integrate monitoring data and facilitate environmental assessments at scales relevant to the use and management of ecosystems. By facilitating regional cooperation, biosphere reserves are helping to fill the gaps between broad-based surveys and site-based monitoring of environmental processes. Through the EuroMAB BRIM, SI/MAB's BioMon Program, and MABNetAmericas, U.S. MAB is effectively promoting this role internationally.

Jim Quinn of the University of California at Davis reviewed the status of U.S. MAB's efforts to facilitate electronic access to information and data on biosphere reserves. An electronic mailing list for U.S. MAB is being supported through the server at the University of California at Davis. All biosphere reserve managers

reporting EMail addresses will be automatically signed up. The Smithsonian supports a mailing list for MABNetAmericas. MAB sites have been established on the World Wide Web for EuroMAB biosphere reserves and MAB Fauna (<http://www.ice.ucdavis.edu>) and two sites for the U.S. MAB Program -- one providing information about U.S. MAB and biosphere reserves (<http://www.>) and the other offering current U.S. MAB publications (<http://www>). UC Davis specialists are available to assist U.S. biosphere reserves wishing to establish their own biosphere reserve home page on the Internet or to develop metadatabases for inclusion in MABFauna/ MABFlora. Interested managers should contact Jim Quinn.

Francisco Dallmeier, director of the Smithsonian - MAB Biodiversity (SI/MAB) Program, reported on the rapid expansion of the BioMon database on species diversity in tropical forests through the establishment of permanent biodiversity monitoring plots in existing and potential biosphere reserves. The basic methodology involves the use of small plots (1/20 ha) and notebook computers in the field to map, record and analyze data for all trees greater than 1 inch dbh. SI/MAB has provided on-site technical training in conservation planning, biological inventory, use of the BioMon protocol and the management applications of BioMon data for specialists in many Latin American countries, and has recently added sites in Africa and Asia. To date, 240 BioMon plots have been established at 32 sites in 22 countries. The BioMon protocol has been adopted as a standard for monitoring forest ecosystems in Canadian protected areas. SI/MAB has established a demonstration/training plot at the Smithsonian Environmental Research Center in the Shenandoah Valley of Virginia -- which is currently under study as a possible future biosphere reserve. Managers of biosphere reserves interested in establishing a SI/MAB forest monitoring program should contact Francisco Dallmeier.

X In May, SI/MAB sponsored an international forum, attended by _____ specialists from _____ countries, to review methodologies and experience in forest biodiversity monitoring, and provide a comprehensive reference (to be published in 1996).

1/ The "Seville Strategy" is based on recommendations from the March 1995 International Conference on Biosphere Reserves (Seville, Spain), in which U.S. MAB and biosphere reserve managers played important roles. The strategy, which has a similar organization to the Strategic Plan for the USBRP, sets forth goals and objectives, and recommended actions for implementation at the international, national, and biosphere reserve levels. UNESCO has allocated \$500,000 from the UNESCO budget for implementing the Strategy. The Statutory Framework--prepared by the UNESCO MAB Secretariat and subsequently revised at the Seville meeting (with substantial U.S. input) and by MAB's International Coordinating Council--sets forth general criteria for selection and operation of the World Network. Copies of the Seville Strategy and the Statutory Framework may be obtained from the U.S. MAB Secretariat, or accessed through the UNESCO MAB Home Page on the World Wide Web (xxxxxx address)

DIRECTORATE REPORTS

Mark Harwell, Chair of U.S. MAB's Human-Dominated Ecosystems Directorate, hosted a review of U.S. MAB's interdisciplinary research program. The chairs of each of U.S. MAB's five Research Directorates discussed the results of their Directorate's core research project and the applications of the project in ecosystem and landscape management. The current projects were initiated between 1992 and 1994. U.S. MAB funding, available for three years, has been used to leverage additional funds from outside sources. Each Directorate project focuses on a large ecological region which include areas designated or potentially suitable as biosphere reserves. In each project, natural and social scientists are developing innovative methodologies to help managers and resource users in the region consider information from many fields to address complex resource issues. More generally, the approaches used and methodologies developed are providing better tools for regional assessments that facilitate cooperative planning and decision making.

Jack Kruse described the High Latitude Ecosystem Directorate's efforts to improve the scientific basis for comanagement of caribou herds in Alaska and Canada by indigenous communities and government agencies. Extensive interviews with community leaders, resource users, and government managers have documented differing perceptions on the changing status of the herds and effectiveness of various management strategies. By integrating the comparative information on human systems with ecological information from existing studies, the project has improved the scientific basis for planning sustainable comanagement of caribou populations to meet community needs, and facilitated communication between the parties involved,

Bob Naiman, chair of the Temperate Ecosystems Directorate, reported on the development and applications of the Land Use Characterization and Analysis System (LUCAS). LUCAS provides a computer-based modelling environment that integrates information on ecological, hydrological, socioeconomic (e.g., access, regulations), disturbance and other factors that control landscape patterns. LUCAS enables planners, managers and resource users to assess the impacts of changes in land use on opportunities for sustaining resource values, such as biodiversity and water quality. The LUCAS methodology was developed and tested in the Olympic Peninsula, a region dominated by large Federal tracts of natural and managed forests, and the Southern Appalachians, where small private tracts predominate. The comparative analysis for the two regions revealed major differences in the importance of various factors in determining landscape patterns. For example, land use regulations were much less determinative of landscape pattern on public than on private lands, suggesting that regulatory approaches may be of limited utility in the Olympic Peninsula. Biosphere reserves interested in exploring applications of LUCAS may download the software from the World Wide Web (<http://www>

) and receive user support through the University of Tennessee.

The many stakeholders in south Florida's Everglades Ecosystem face incredibly complex challenges in balancing the requirements for sustaining an internationally significant wetland ecosystem with the demands of agriculture and burgeoning human populations in the increasingly urbanized surrounding environments. MAB acquired a relationship with this ecosystem in 1976 when Everglades National Park (including the former Fort Jefferson National Monument, now the Dry Tortugas National Park) was designated by UNESCO as biosphere reserve. The park, which is mostly a core area, is adjoined by water management districts and other protected management units in different ownerships which are not parts of the designated biosphere reserve but which, along with the surrounding zone of cooperation, comprise the larger ecosystem for implementing biosphere reserve concepts. Mark Harwell discussed the Human Dominated Ecosystem Directorate's core project, initiated in 1992 and now nearing completion, to develop a consultative process for identifying desired ecological endpoints, documenting available information on natural and human systems, identifying and filling information needs, and involving specialists and ecosystem stakeholders in the process of integrating and displaying information from many fields to help assess alternative futures for the Everglades ecosystem. Cooperation involving Federal, state, and local governments; private entities; and citizens in the Everglades is extensive, highly structured and increasingly focused on ecosystem management. To support these efforts, the Directorate developed and successfully tested a geographic information system and methodology for interdisciplinary consultation that helps ecosystem stakeholders develop a shared understanding of complex interactions between society and environment, and thus empowers them to better formulate shared goals for ecosystem sustainability. The project has been highly leveraged with funding and technical support from other agencies. The methodology is currently being used to help support ecosystem management in the New Jersey Pinelands Biosphere Reserves and at sites in China and India.

The core project of the Coastal and Marine Ecosystems Directorate, described by Michael Crosby, focuses on the ecological and socioeconomic effects of managing human access to marine environments in Hawaii, California's Channel Islands, and the Florida Keys. The research, which was initiated in late 1994, is developing methods for assessing how management of recreational and commercial access to reef systems (e.g., through establishment of marine harvest refugia) influences the biological diversity and productivity of larger marine ecosystems, and opportunities for the sustainable uses of regional fisheries. Investigators in each ecosystem are cooperating with managers and resource users in developing guidance for management based on the research findings.

John Wilson reported on the Tropical Ecosystem Directorate's efforts to facilitate communication and exchange of resource

information for the Mayan Forest of Mexico, Guatemala, and Belize. The ecosystem---the largest contiguous area of tropical forest north of the Amazon---includes several biosphere reserves. For many years, conservation organizations and donor organizations have supported numerous in-country research and technical assistance activities, but there has been little coordination on an ecosystem basis. In cooperation with host country agencies, regional programs, and nongovernmental organizations, the Directorate convened regional workshops that identified sources and gaps in resource information, developed a standardized methodology for reporting, and prepared the first ecosystem-wide directory of data sources for the Mayan region (initial Version 1.0a, published in November 1995, is available from the U.S. MAB Secretariat; following review by the cooperating parties, the directory will be available on the Internet). The project has opened new channels for communication, including the development of Internet capability, among the designated biosphere reserve sites, other management units, and the stakeholders in the large zone of cooperation that comprise the Mayan Forest ecosystem.

INSERT BR DIRECTORATE REPORT

RESULTS OF THE MANAGERS' SURVEY

William Gregg summarized the results of a survey of managers to assess their perceptions about their biosphere reserves (Attachment C). Nearly two-thirds (29) of the 47 U.S. biosphere reserves responded.

About half of the biosphere reserves reported cooperative programs, such as regional MAB programs, that identify explicitly with biosphere reserve concepts and goals. The other half reported cooperative programs consistent with these concepts and goals, but no programs explicitly identified with them. Managers in the first group reported more benefits, more program participants (averaging 14 of the 18 categories of stakeholders surveyed, vs 9 for the "Consistent Group"), more substantial participation among all categories of stakeholders, and more significant management benefits from their biosphere reserve than those in the second group. Managers in the first group who reported both explicit and consistent programs (i.e., "Mixed Group") indicated lower management benefits than those reporting only explicit programs (i.e., "Explicit Only Group"), but still reported much greater benefits than those reporting only consistent programs (i.e., "Consistent Group").

Of the 16 categories of management benefits surveyed, the Explicit Only, Mixed, and Consistent Groups rated benefits to be significant, on average, for 8, 0, and 0 categories, respectively; obvious for 6, 11, and 5; and negligible for 2, 5, and 11. group. In the Explicit Only Group, significant benefits (in order of decreasing average ratings) were reported for facilitating ecosystem management, promoting environmental awareness,

encouraging research, facilitating international cooperation, addressing regional environmental problems, improving political support for conservation, obtaining information on natural systems and fostering an ethic of sustainability. Obvious, but not significant, benefits were reported for improving public recognition of resource significance, the effectiveness of planning and decisionmaking, and public consultation and participation; facilitating regional economic development; improving access to information on human systems, and increasing nature protection. Benefits in increasing operating budgets and protecting cultural resources were considered negligible. The results suggest that explicit identification with biosphere reserve concepts and goals may enhance the management benefits of many cooperative activities. However, greater efforts are needed to strengthen the benefits of cooperative programs in sustainable development through local participation and emphasis on human systems in biosphere reserve activities.

Of the 18 categories of potential participants surveyed, biosphere reserve managers reported "substantial participation" only for Federal, state and regional agencies, universities, and research institutions. The level of participation of these partners was about the same for the Explicit and Consistent Program Groups. However, the Explicit Group reported greater involvement of other stakeholders essential to achieving biosphere reserve goals -- i.e., "some participation" being reported for local governments, conservation groups, resource users, schools, citizen volunteers, and economic development entities (for the Consistent Group, this level was reported only for conservation groups and resource users). The Explicit Group reported "little participation" for foundations, service and religious organizations, native Americans, commercial organizations, other biosphere reserves, international organizations and foreign governments. However, even at these low levels, participation is greater than for the Consistent Group. Although broad-based partnerships required to implement biosphere reserve goals are not yet fully established, many U.S. biosphere reserves appear to be moving in this direction.

Managers reported that identification with biosphere reserve concepts is greatest among managers, less among staff and partner agencies and organizations, and least among local people. About half the managers indicated having received expressions of philosophical concerns about biosphere reserves -- e.g., perceived association with the "New World Order" and big government --- from various parties (8 ex 29 responding reserves) or about the potential implications of the biosphere reserve on uses of private property (9), infringement of economic development (8), international influence on local affairs (7), or traditional uses of resources (6). Concerns were reported more often from local residents (7 reserves) and private organizations (6), less often from resource users (4) and state and local governments (3), and least often from Federal agencies (2) and visitors (2). Although only two biosphere reserves (Champlain-Adirondack and Big Bend) -- or 7% of respondents -- reported organized opposition to the

biosphere reserve, about a quarter of the respondents reported that opportunities for cooperation have been lost or cooperative activities deferred because of concerns from various groups. The results underscore the need for MAB and biosphere reserves to address misunderstandings about the implications of biosphere reserves through improved communications and greater public education and involvement.

Managers rated 11 activities according to their perceived benefits in enhancing local biosphere reserve programs. Nine of these activities were included in a 1992 U.S. MAB survey to provide information for planning the U.S. Biosphere Reserve Program. Not surprisingly, managers gave high marks to strengthening activities perceived as directly supporting their management goals, and somewhat lower marks to activities related to building the operational framework for the U.S. Biosphere Reserve Program, including the world network. Reported as the most needed are more funds and staff to implement biosphere reserve goals, more emphasis on long-term ecological research and inventory/monitoring of biodiversity, and development of an enthusiastic local constituency through public education and local participation. Managers viewed as less important the development of policies and guidance from agencies, better guidance and communication from U.S. MAB, establishment of regional MAB programs, more communication among biosphere reserve managers, and development of international linkages. There were only minor differences in the scores and relative rankings of the same activities between the two surveys. More involvement in MAB Directorate programs---surveyed for the first time in 1995---was seen as the least important of the 11 activities, although lack of familiarity with Directorate programs no doubt influenced this perception.

Respondents offered a several additional suggestions to U.S. MAB for enhancing their biosphere reserve programs, including improving politicians' awareness of biosphere reserves; greater U.S. MAB support for managers' efforts to address regional threats; encouraging agency recognition of local staff and time requirements in implementing biosphere reserves; providing clear channels of communication and policy approval for agency participation in MAB activities; and encouraging integrated interpretation of natural resources, history, and cultural resources.

Overall, the survey indicated that managers see significant value in biosphere reserves and that biosphere reserves are making a difference in enabling managers to obtain information, build regional partnerships, and demonstrate ecosystem-based management.

CASE STUDIES OF U.S. BIOSPHERE RESERVES

William Gregg moderated presentations of 11 case studies of existing and proposed U.S. biosphere reserves. The case studies are windows on efforts to plan and implement biosphere reserves in different biogeocultural regions. Summaries were distributed in the workshop materials to facilitate discussion (Attachment D).

Summaries includes a brief description of the region and the biosphere reserve, participation in the biosphere reserve, the issues of concern, activities and accomplishments, problems encountered and lessons learned, and recommendations to U.S. MAB. The Eastern Forest is the largest biogeographical province in the U.S. and has the most designated (5) and pending (2) biosphere reserves. The five case studies for this province illustrate many approaches and stages in implementing biosphere reserve concepts. The Southern Appalachian Biosphere Reserve, presented by Hubert Hinote, was the first U.S. biosphere reserve to establish a regional organization explicitly to implement the biosphere reserve concept. The organization includes a Federal-state cooperative--the Southern Appalachian Man and the Biosphere (SAMAB) Cooperative--established in 1988; the SAMAB Foundation, established in 1990 to facilitate private sector; the SAMAB Consortium of colleges and universities now being developed; a coordinating office; and six permanent committees for planning and coordinating activities that contribute to biosphere reserve goals. The Biosphere Reserve presently consists of 5 designated sites under Federal, state, and private ownership; a surrounding 168-county transition area comprising parts of 5 states; and the SAMAB organization itself. SAMAB provides an important regional framework for coordinating environmental monitoring, research on environmental issues, environmental education, and demonstrations of ecosystem management and ecologically sustainable community development. SAMAB is implementing numerous cooperative projects, including a region-wide ecological assessment, and is cooperating with biosphere reserves in several European countries. Although widely recognized as a particularly successful biosphere reserve model, SAMAB continues to rely on voluntary contributions from participating agencies to support program coordination. Lack of secure base funding continues to make the program vulnerable in the volatile budgetary environment.

Jeff Bradybaugh reported on the Mammoth Cave Area Biosphere Reserve (MCABR) in central Kentucky, where efforts focus on demonstrating sustainable development and economic uses that support local communities while sustaining the cave and surface ecosystems the core area -- Mammoth Cave National Park. A MCABR Cooperative has been established by a regional development authority to coordinate the biosphere reserve program. The Cooperative includes Federal and State agencies concerned with conservation and regional economic development, which have joined in implementing a variety of cooperative projects including a regional geographic information system, a groundwater hazards map, a long-term ecological monitoring demonstration project in the core area, an integrated regional program for mitigating effects of non-point source pollution on regional water quality, and teacher training in environmental education. A consortium of government and private institutions to promote environmental education is being organized.

Dave Foster described several years of cooperation leading to the imminent nomination of the Ozark Highlands Biosphere Reserve.

New Jersey Pinelands

Catskills

Colorado Rockies

Crown of the Continent

Sonoran Desert

Tijuana Watershed

Lake Superior

PLENARY ADDRESSES.

RECOGNITION AWARDS. U.S. MAB Chairman Bibler recognized several individuals for outstanding accomplishments in implementing the biosphere reserve concept. Harold Smith, Superintendent of Organ Pipe Cactus National Monument, was recognized for more than a decade of efforts build partnerships for implementing biosphere reserve concepts in the western Sonoran Desert region. Karen Wade, Superintendent of Great Smoky Mountains National Park, was honored for her steadfast support of the Southern Appalachian MAB Cooperative and her contributions to strategic planning for the U.S. Biosphere Reserve Program. Finally, Dr. Raymond F. Dasmann, emeritus professor at the University of California at Santa Cruz, was recognized for his contributions to UNESCO's initial conceptualization of biosphere reserves and the biogeographic framework for selecting biosphere reserves, and to the implementation of biosphere reserves---most recently in the Central California Coast---during the past 25 years.

TRILATERAL AGREEMENT.

WORK GROUP SESSIONS

On the second day, Work Groups were convened to develop recommendations for implementing each of the six goals of the Strategic Plan. A facilitator and a recorder were designated for

each Work Group. A one page summary including the Plan's objectives and proposed actions relating to the goal, and the expected workshop products, were provided at registration to each participant for each Work Group session.

WORK GROUP 1: COMMUNICATION (Presentation: John Dennis)

ISSUES IDENTIFIED BY THE WORK GROUP

The Work Group agreed that communication at the local level should focus on the unique benefits of biosphere reserves as a global network of ecosystem-based demonstration areas for conservation, sustainable development, and local cooperation; the "value added" of regional MAB programs in building broad understanding and support for the efforts of the program partners to help address issues of local concern; sharing of case studies of experience in implementing biosphere reserve concepts; and the communication of research results on issues of local importance to different audiences and cultures, and the implications of research findings for local planning and decision-making.

The Work Group agreed that biosphere reserves should give special attention to developing effective cross-cultural communication that takes into account the differences among cultures in decision-making processes.

The Work Group identified the local audience for communication as institutions and individuals with an interest in conservation and development of the region -- i.e., the stakeholders in regional MAB programs. These stakeholders include managers and scientists working at biosphere reserve sites, government agencies at all levels, special interest groups, various cultures, school children, and local citizens. The larger audience includes entities with an interest in the data generated, information developed, and lessons learned from the regional MAB programs. These entities include other biosphere reserves, the national MAB organization, national policy makers, the general public, and the international conservation, scientific and economic development communities.

The Work Group identified several methods that have proven useful for communicating biosphere reserve concepts, information, and data to local audiences. These methods include interpretive materials (e.g., brochures, exhibits, audiovisuals) and programs at biosphere reserve sites, special events (e.g., forums on local conservation and development issues, cultural demonstrations, community festivals), newsletters, press releases on important accomplishments and events, magazine articles, and television documentaries on regional issues (e.g., the recent public TV special on restoration of the red wolf in the Southern Appalachians). In addition, the Work Group noted the particular value of visits of specialists from U.S. MAB and other biosphere reserves who can help existing and would-be partners in regional MAB programs adapt the biosphere reserve approach concepts to meet

local needs.

The Work Group recognized the growing importance of electronic communication through electronic mail, electronic bulletin boards, and posting information on the World Wide Web. Electronic communication is becoming an essential tool for linking local partners in regional MAB programs, and for communication among biosphere reserves and between biosphere reserves and larger audiences. However, at present, many local partners and much of the larger audience are not yet electronically connected. Development of electronic communication capabilities will need to be balanced with other forms of communication in ways appropriate to each local situation. Regional MAB programs, and the biosphere reserve sites themselves, can play an important role in bringing the practical benefits of electronic communication technologies to the local partners.

Brand Niemann and Jennifer Gaines, from the National Biological Service, and Jim Quinn, from the University of California at Davis, reviewed recent developments in the use of electronic communication to support the U.S. Biosphere Reserve Program, including the establishment of electronic discussion groups for U.S. MAB and MABNetAmericas (the network of Western Hemisphere biosphere reserves), the development of international on-line biological inventory databases for biosphere reserves (i.e., MABFauna), and the establishment of the U.S. MAB Home Page on the Internet, which provides current information on the U.S. MAB program, U.S. biosphere reserves, and on-line access to selected U.S. MAB publications.

Brand Niemann led a discussion of technical issues in developing home pages on the Internet, and offered to provide training for representatives from biosphere reserves desiring to serve a home page on the Internet. Biosphere reserve home pages should be easy to install on the server, suitable for access in low-end connectivity situations (e.g., avoiding graphics that tie up less capable systems), and transparent to all types Internet browsers. Once a biosphere reserve has decided to establish a home page, continuous attention to quality control in managing the information provided on the Internet will be essential.

RECOMMENDATIONS

Develop Media Adaptable to Local Situations. U.S. MAB should expedite preparation of a brochure on the U.S. MAB Program that can be readily adapted by individual BRs to present local material. A MAB travelling exhibit should be prepared to facilitate communication with professional. The exhibit should be designed to allow flexibility in providing material on particular biosphere reserves or topics relevant to the interests of intended audiences.

Strengthen Use of Electronic Communication and the World Wide Web. The national MAB organization should encourage and support electronic communication, including expanded use of the World Wide Web, to provide information on the U.S. MAB program and facilitate sharing of data, information, and experience involving U.S.

biosphere reserves. Special attention should be given to identifying biosphere reserves with home pages on the Internet. U.S. MAB should provide guidance to encourage consistent style for presenting information on MAB and biosphere reserves through biosphere reserve home pages, and should encourage linkages between biosphere reserve home pages and other home pages containing information on MAB and biosphere reserves (e.g., UNESCO, USMAB, MABFauna).

Convene Workshop of Public Information Contacts. Regional MAB organizations and biosphere reserves should designate a public information officer or other individual responsible for developing and disseminating the MAB message. Once a cadre of such individuals have been identified, U.S. MAB should sponsor a workshop to enable them to share experience and develop recommendations to improve communication.

Strengthen Local Cross-cultural Communication. Recognizing the importance of cross-cultural and multi-sector communication, biosphere reserve managers should consider identifying people on their staff who can communicate MAB concepts and the work of the biosphere reserve most effectively to particular professional groups, special interests, and cultures.

WORK GROUP 2: EDUCATION AND TRAINING (Presentation: Bob Valen,
Karen Wade, Elizabeth Owen)

ISSUES IDENTIFIED BY THE WORK GROUP

The Work Group agreed that the overarching goal of education and training in U.S. BRs should be to convey the story of the USMAB Program as a voluntary concept, developed and applied locally, that involves conservation and economic problem solving, and celebrates sense of place, connectivity, relevance and ownership.

It is time to be aggressive in getting out the message of BRs through education and training at all levels. Although MAB is not the only approach for empowering local interests in addressing complex problems, its benefits have been widely demonstrated. Educational and training activities should foster broad understanding of the value of MAB as a model to deal with environmental and development issues in non-confrontational, democratic, decentralized, respectful ways through full partnership of stakeholders.

The literature on MAB and biosphere reserve concepts contains terminology that may be difficult for local people to understand. Unclear or misinterpreted terminology stifles interest and enthusiasm. Educators and trainers must choose language that communicates effectively to local people, and avoid jargon and complex terminology.

RECOMMENDATIONS

The Work Group recommended a coordinated education and training effort involving local partners in regional MAB cooperatives, biosphere reserve staffs, and the national MAB organization.

Develop and Celebrate the Local MAB Story. Local partners should develop the MAB story in local lingo. The emphasis should be to educate local people by involving them in the story. The story should be simple, anecdotal, personal and specific. It should deal with the local issues of importance to the community and the citizens, and what the MAB partners, including local people, are doing about them. The story will develop gradually in many chapters, which are progressively added over time. The local partners should seek ways to celebrate the MAB story in its community and cultural context, e.g., through stories of people with spiritual or economic ties to the land. With the help of the media, they should convey the MAB story through local leaders who act as catalysts.

Establish Unifying Goals for Local Education. Local education should foster and facilitate local management of resources, a shared sense of community and responsibility, consensus on shared values, sharing of resources for the good of the communities, and the airing of differences even if there is not always agreement.

Train the Trainers on Biosphere Reserve Staffs. Biosphere Reserve staffs need to become thoroughly familiar with MAB concepts and practical local experience in implementing the goals of the Strategic Plan. Training should be an integral component of the annual BR managers' meeting, or whenever biosphere reserve managers get together. By enabling managers and stakeholders to share successes and failures in communicating with local communities, the sessions will enable key participants in the U.S. Biosphere Reserve Program to develop the new language and approaches needed to motivate local participation and support. Individuals trained at these "train the trainer" sessions would be responsible for sharing their knowledge with biosphere reserve staff and local partners in biosphere reserve programs. The Work Group encouraged "brown bag" seminars to improve internal communication among biosphere reserve staff

Increase International Exchanges and Use of Electronic Communication. The Work Group urged greater international sharing of experience among biosphere reserves facing similar problems, and greater use of electronic communication.

Strengthen U.S. MAB Support for Local Education on Biosphere Reserves. The National MAB Organization should provide the philosophical and conceptual underpinnings of the MAB story through written material (in plain English), by providing speakers for local forums, and encouraging networking among U.S. biosphere reserves. This responsibility includes collecting and disseminating case studies, short stories, and vignettes from BR experience; facilitating "training the trainers" sessions at biosphere reserve managers' meetings; ensuring coordination among biosphere reserves; and developing contacts with national magazines and other media.

Increase Education on the Local Benefits of MAB Research. The national MAB organization should encourage sharing, synthesis, and interpretation of scientific data and information, with emphasis on showing applicability of research results in local terms (e.g., explaining effects of acid deposition to the community). MAB should encourage scientists involved in MAB research to become more involved in local education to disseminating the fruits of their research.

WORK GROUP 3: FILLING GAPS (Presentation: John Humke)

ISSUES IDENTIFIED BY THE WORK GROUP

The Work Group felt that the criteria and guidelines being developed by the Biosphere Reserve Directorate for selecting biosphere reserves will provide a good framework for filling gaps in the representation of Biosphere Reserves in terrestrial and coastal/marine biogeographic areas. The Work Group therefore focused on ways to encourage local efforts of agencies and other stakeholders to enthusiastically bring their landscapes into the BR program.

"The challenge [in filling gaps] is not in the core areas -- we can do that -- the challenge is much needed improvement in our understanding, promoting, and establishing the zones of cooperation around the core areas which are there."

The Work Group felt that MAB regional cooperatives are an ideal mechanism to enable local communities to develop and discuss common goals for conservation and development, obtain access to reliable information, and share practical experience. Any entity can bring the MAB approach to the attention of local people, provided that local communities are involved and in charge from the start. Special emphasis should be placed on involving citizens groups, tourism groups and economic organizations that can assure that the MAB partnership develops solid ties to the communities' aspirations for sustainable development.

RECOMMENDATIONS

Assess Biogeographic Opportunities for Cooperation. The Work Group recommended that the Biosphere Reserve Directorate's Committee on Completing the Network should continue their analysis of biogeographic provinces to identify gaps in representation, and assess functional gaps in BR cooperative programs. However, the Work Group felt that identifying opportunities for encouraging productive ongoing cooperative groups to help fill these gaps should be included in the analysis. The Work Group therefore recommended that the Committee should gather and analyze data to provide perspective on what it really takes to successfully establish new biosphere reserves, given the political and polarized climate now prevailing in the U.S.. The Work Group recommended that the Committee review the 667 landscape-level citizens' initiatives, identified by The Wilderness Society and the University of Michigan, which have formed to accomplish MAB-like activities during the last 5 years. The Committee should identify those groups that have the most potential to implement Biosphere Reserve goals and see where they overlap with biogeographical gaps in the U.S. Network. The analysis will provide essential information to help develop rationales for convincing productive groups that it is in their interest to consider the MAB alternative.

Strengthen Technical Assistance to Local Groups. U.S. MAB should support hands-on assistance to local groups working on emerging MAB programs. Visits by MAB people with experience and dedication to biosphere reserves should be expanded. The only caution is to deemphasize MAB jargon! United Nations links, State Department connections, and recommendations from the Seville conference "at best" tend to cause confusion locally and should be downplayed at the local level.

Support Planning of New Biosphere Reserves. U.S. MAB's small grants program should support feasibility studies for new biosphere reserves, as well as cooperative programs to implement MAB goals involving existing BRs. Better communication with existing local groups pursuing MAB goals is needed.

Increase Representation of Sustainable Development Interests in U.S. MAB. Agencies with interests in core areas of biosphere reserves are well represented in the national MAB organization. Institutions and associations that are critical to success of the zones of cooperation should be more involved. Such groups (e.g., National Association of Counties, industry associations) should be included on the U.S. National MAB Committee to enhance the relevance of MAB to local needs and foster support at the local level.

WORK GROUP 4: LOCAL PARTICIPATION (Presentation: Doug Nadeau
and Wendy Laird)

ISSUES IDENTIFIED BY THE WORK GROUP

The Work Group stressed that local consultation and participation should be the foundation of a successful biosphere reserve. Local agencies, organizations, and citizens should feel a shared ownership in the programs and activities undertaken to implement biosphere reserve concepts, regardless of which participant(s) provide the necessary financial and human resources. The Work Group began its discussion by identifying various barriers in developing the role of U.S. biosphere reserves in facilitating local cooperation. These barriers include

- o local participants' misperceptions that MAB is Federally controlled and emphasizes basic research rather than applications to meet local needs;
- o MAB jargon that is not understandable to local people and often misinterpreted;
- o management agencies' concerns that participation in local MAB partnerships might limit future management prerogatives and options;
- o lack of vision and integration of agency planning processes, especially in addressing ecosystem issues, and the practical difficulties managers face in using their funds and human resources outside the boundaries of their protected areas;
- o lack of consultative frameworks to facilitate dialogue with private community, and lack of experience in participating in such dialogue. (The Work Group noted that several nonprofit organizations have resulted from local cooperation to implement MAB concepts, offering managers new frameworks for cooperation with the private sector);
- o lack of continuity in the relationships between agencies and local people often due to the rapid turnover of the people involved
- o problems in communication among cultural and socioeconomic groups within local communities
- o impatience, especially when urgent and immediate local needs obscure local interest in the long-term vision of MAB

RECOMMENDATIONS

The Work Group's recommendations focused on incentives and approaches to overcome barriers to local participation.

Support Local Cooperation Initiatives. U.S. MAB should continue to facilitate the efforts of local groups to implement biosphere reserve concepts. The small grants program, administered through the Biosphere Reserve Directorate, should be continued. U.S. MAB should encourage the formation of MAB-affiliated groups and cooperative organizations that offer local agencies, private entities and citizens neutral frameworks for planning and coordinating biosphere reserves as local initiatives. A unifying objective of such initiatives should be to enable participants to overcome narrow interpretations of self interest in favor of a wider vision of greater benefits to ecosystems and human communities. (It was observed in the plenary discussion that site managers and other stakeholders who act as facilitators are more effective than those who act as leaders in biosphere reserve initiatives.) In addition to structured cooperation, e.g., through committees, these initiatives should also facilitate informal consultation and collaboration, including social functions, that welcome citizen participation in non-intimidating formats.

Strengthen U.S. MAB's Catalytic Role and Guidance. U.S. MAB should identify and assess approaches being used to involve local interests in ecosystem-based cooperation, and communicate the lessons learned to stakeholders in local biosphere reserve initiatives. In supporting these initiatives, U.S. MAB's role should be to **catalyze and step aside**, and to strictly avoid top down approaches that could stifle local creativity and commitment. U.S. MAB should also help local partners discover ways to make the biosphere reserve an important and visible part of their daily business (e.g., by including biosphere reserve responsibilities in the job descriptions of biosphere reserve managers).

Strengthen Ties to Local Culture, Environment, and Development. U.S. MAB should present biosphere reserves as a useful tool to help communities achieve positive and understandable change, with clearly understood benefits to the community and links with sustainable development. The role of biosphere reserves in empowering communities to sustain desired cultural values should receive more balanced attention along with the traditional emphasis on sustaining natural values.

Support Sharing of Experience Among Biosphere Reserves. U.S. MAB should support the sharing of experience among biosphere reserves facing similar problems and challenges in sustaining these cultural and natural values, including appropriate international exchanges involving local interests. A compendium of ideas and case studies on ways to implement biosphere reserve concepts should be prepared to assist local stakeholders in implementing the general goals and objectives of the Strategic Plan for the U.S. Biosphere Reserve Program, which the Work Group considered to provide a useful and

sufficient general guidance for local efforts.

Assure Relevance of Research to Local Community Needs. Research and monitoring in U.S. biosphere reserves should be relevant to the conservation and development goals of local communities, and communities should be consulted in identifying research needs and priorities. Nonprofit MAB-affiliated organizations should apply for appropriate grants (e.g., through the National Science Foundation) for research and other biosphere reserve activities.

Reference Available:

The Government of British Columbia recently prepared a 4-volume reference on local participation, which can be obtained from

WORK GROUP 5: OPERATIONAL FRAMEWORK (Presentation: Dick Ring)

ISSUES AND RECOMMENDATIONS

The Work Group was comfortable with the general objectives in the Strategic Plan, and recommended the following of issues and recommended actions (in order of decreasing priority).

Identify Managers' Authorities, Roles and Responsibilities. The legal authority for the U.S. participation in the international MAB Program was reported to the Work Group as a 1946 law that authorized U.S. participation in UNESCO activities. The Work Group noted that many, if not most, MAB activities are domestic and relate more to ecosystem management than to international cooperation. For Federal biosphere reserve managers, it is especially important to know how the various authorities that govern relationships with the public (such as NEPA, FACA, etc.) apply to cooperative activities under the aegis of MAB. To identify these authorities, U.S. MAB and Federal agencies managing biosphere reserves should prepare and circulate a joint review of the legal authorities for the current and projected activities of Federal management agencies under the under the auspices of U.S. MAB. The review should distinguish between international and domestic program activities.

There are currently 47 U.S. Biosphere Reserves containing 99 administrative units under Federal, state, local, and private ownerships. Various regional groups and organizations have been established, or are being planned, to facilitate cooperation involving these units. To facilitate and encourage participation in implementing biosphere reserve concepts, U.S. MAB should prepare and disseminate a clear written statement on the roles, functions and responsibilities of the entities responsible for managing biosphere reserves, taking into account the variety of situations. The statement should include information on the opportunities and rights of participants and other parties interested in or affected by efforts to implement biosphere reserve concepts.

Strengthen Links between MAB Research and Biosphere Reserves. MAB research projects should be directly linked with the management needs of the biosphere reserves. Case studies and applications of research results should be widely shared with biosphere reserve managers for evaluation and appropriate action.

Strengthen Awareness among Agencies and the Administration. There is a need to promote awareness of value of the U.S. Biosphere Reserve Program as a useful voluntary approach that can support agency missions. As other tools and forums are also available (e.g., ecosystem management), agencies need information in order to make informed decisions. U.S. MAB should encourage local managers to recognize the approach, explore how it may work for them, and give recognition to managers who use the approach innovatively. U.S. MAB should seek to empower local managers in their efforts to

implement the goals and objectives of the Strategic Plan for the U.S. Biosphere Reserve Program, but let them determine the most effective implementation strategy.

U.S. MAB should explore ways to enhance the communication of Washington Office agency contacts and field personnel in biosphere reserves with existing groups concerned with such areas as biodiversity, global change, ecosystem management, and improving government performance. Point persons and groups should be identified to represent the interests of the U.S. Biosphere Reserve Program with particular groups. U.S. MAB should also provide information to leaders who can work with members of Congress, government officials and others in positions to make a difference for the U.S. Biosphere Reserve Program.

Develop Clear Organizational Frameworks for Agency and Private Sector Participation. U.S. MAB should encourage flexibility in agency efforts to establish their organizational framework for participation in the U.S. Biosphere Reserve Program and individual biosphere reserves. Each biosphere reserve should address coordination effectively consistent with local circumstances. The biosphere reserve manager normally should coordinate biosphere reserve activities, except that where multiple agencies are involved, there should be a mechanism for coordination. Regardless of the organizational framework selected, there must be a clear and explicit commitment to the MAB program with flexibility as to local solutions.

Agencies should use existing national and local partnerships and frameworks wherever possible and to develop appropriate memoranda of understanding and agreements for accomplishing specific tasks.

Establishing frameworks for private sector participation requires identification of the levels and types of authorities available to Federal, state, local, and private managers to engage in biosphere reserve activities in particular situations.

USMAB should conduct a training course for agencies and their biosphere reserve managers on the authorities available for cooperation and how to use them effectively in achieving the goals of the U.S. Biosphere Reserve Program.

Encourage Use of Biosphere Reserves for Research. U.S. MAB should encourage scientific uses of biosphere reserves by publicizing specific research plans and needs, scientific opportunities unavailable elsewhere, protection of research sites, possibilities for interagency cooperation and leveraging of technical and financial support for research; and availability of housing, research facilities and logistic support.

Most land managers require permits for research. U.S. MAB should encourage agency partners in biosphere reserves to use permits to facilitate coordination of research activities cooperation. (e.g., in the zone of cooperation adjoining Everglades National Park

Biosphere Reserve, coordinated permitting helps 9 federal agencies in the Florida Bay Research Consortium coordinate 70 projects and a \$6 million research budget with virtually no duplication and major cost savings).

U.S.MAB should increase emphasis on cultural and social sciences research relevant to management needs. MAB Research directorates utilize biosphere reserves for their core research programs and leverage support from other sources.

Develop a Fully Integrated MAB Program. The Work Group endorsed an annual meeting of the MAB Directorates to review accomplishments and recommend priorities for integrating MAB research with the U.S. Biosphere Reserve Program.

Development of a strong domestic program should take precedence over international activities. U.S. MAB should clarify the role and duration of the MAB Research Directorates following completion of their core research projects.

Increase Outside Sources of Funding. U.S. MAB should evaluate the evolution of successful initiatives, such as the Southern Appalachian MAB Cooperative and the International Sonoran Desert Alliance, for lessons on raising funding from diverse sources; and should support a national fund-raising initiative through the Biosphere Reserve Directorate to increase private funding. The Directorate should become thoroughly familiar with requirements for securing outside grants.

The amount of outside cost-sharing should be weighted heavily in allocating U.S. MAB funds for biosphere reserve activities. U.S. MAB should continually expand sources of support for the U.S. Biosphere Reserve Program. International activities should be supported wherever possible by international donor agencies.

Market Biosphere Reserves. U.S. MAB should develop an aggressive marketing strategy that links U.S. biosphere reserves with appropriate communication networks and includes development of brochures and other appropriate media.

WORK GROUP 6: RESEARCH AND MONITORING (Presentation: Reed Bohne)

ISSUES IDENTIFIED BY THE WORK GROUP

The Work Group focused on the integration of the U.S. Biosphere Reserve Program and the interdisciplinary research of the U.S. MAB Research Directorates. The Research Directorate chairs, who had met the previous day on this topic, brought their recommendations to the Work Group meeting.

The insights and methodologies being developed through the U.S. MAB Research Directorates can help biosphere reserve managers address important management issues. The Work Group noted that biosphere reserve managers are not well informed on the Directorates' core programs and opportunities for involvement. Although the Directorates have taken steps to involve biosphere reserve managers in their programs, there is little consistency regarding how the managers' input or involvement is structured.

RECOMMENDATIONS

Hold Regular Meetings of Directorate Chairs. The Work Group recommended that U.S. MAB set aside time within the agenda of the National MAB Committee for the Biosphere Reserve and Research Directorate chairs to meet and discuss cooperative planning and inter-Directorate collaboration on core projects. The U.S. MAB Secretariat should set aside funds to support these inter-Directorate activities.

Prepare a Project Decision Plan. The National Committee should work with the Directorates to prepare a project decision plan. The plan should outline the current status of each research project and the Biosphere Reserve Directorate's program, identify planning milestones including opportunities for input from managers to guide decisions on project scope and direction, and determine how to phase the projects and spread their costs across the Directorate programs. To support the planning process, the Biosphere Reserve Directorate should survey biosphere reserve managers to identify the management issues that could serve as the basis for developing new core research projects or for extending existing core projects.

Prepare Guidelines for Management Involvement. The Biosphere Reserve Directorate, in cooperation with the Research Directorates, should prepare guidelines for involving the management community more actively in identifying management problems, and in providing input for planning, implementing, and evaluating core research projects. Research projects should include a management component and produce an appropriate reference document useful to the manager(s) of the specific sites and having the greatest possible transferability to broader management community.

Prepare a Long Range Funding Plan. The Directorates should prepare a long-range funding plan on a 5-year time horizon. The plan would assist the National Committee to identify needed support from sponsoring agencies by providing a clear indication of multi-year funding needs for an integrated national program. Because the Directorates' program funding cycles are at different stages, improved planning and coordination among Directorates can help avoid the boom-bust situations resulting from year-to-year variations in Directorates' funding requirements. The Work Group recommended that the initial Long-Range Funding Plan should be based on the assumption that current levels of total funding for the U.S. MAB program will continue.

Improve Communications. Research Directorates should prepare periodic reports on their core projects for biosphere reserve managers to maintain levels of awareness of topics being investigated and applications in meeting management needs. The Biosphere Reserve Directorate should improve its efforts to communicate Directorate activities to biosphere reserves and facilitate communication among biosphere reserves.

Discussion

Hubert Hinote noted the difficulty in conducting long-term planning under the U.S. MAB's current funding process for MAB, which depends on voluntary contributions rather than annual assessments and long-term agency commitments. Roger Soles noted that individual Directorates already provide multi-year budgets which the National Committee uses in identifying and funding long-term needs. He stressed the catalytic role of U.S. MAB funds, the importance of leveraging from other sources, and the important role of managers in developing support for MAB locally and within their agencies.

Dick Ring suggested that biosphere reserves could do their own gap analysis to identify needs and priorities for natural and social science research. Hinote responded that a key rationale for establishing regional MAB organizations, such as SAMAB, is to give managers, researchers and stakeholders a forum for identifying management issues, gaps in data, research needs and priorities.

Jack Kruse suggested that managers' involvement should focus primarily on identifying priority management problems for the Directorates to consider in developing research projects.