

# Closing the Gap Between Research and Management

Deborah M. Finch<sup>1</sup> and Marcia Patton-Mallory<sup>2</sup>

---

**Abstract** — In this paper, we evaluate the reasons for gaps in communication between researchers and natural resource managers and identify methods to close these gaps. Gaps originate from differing patterns of language use, disparities in organizational culture and values, generation of knowledge that is too narrowly-focused to solve complex problems, failure by managers to relay informational needs, and failure by researchers to synthesize and package knowledge in useable forms. Information-sharing procedures that can stimulate communication among individuals in different organizations, geographical locations, positions, and disciplines include research and management reviews, information networks, research and management prioritization processes, technical assistance incentives, and demonstration projects. *Partners in Flight* can be viewed as a model program that facilitates communication and cooperation across traditional barriers.

---

## INTRODUCTION

In government and nongovernment organizations alike, management styles and methods are changing as administrative leaders, line officers, and staff shed old ways of doing business to accommodate the environmental values and goals of a younger, more diverse, working generation. Thus, in response to public, academic, and employee demands to conserve and restore biological diversity and intact ecosystems, integrated land management approaches, such as the U.S. Forest Service's "Ecosystem Management" strategy, are being implemented by federal, state, and private organizations (Brown and Harris 1990, Salwasser 1991). New research is now focusing on spatial and temporal problems of species inhabiting managed landscapes and regions, whether the species are single or multiple, rare or common, specialized or generalized, or declining or increasing. Innovative management steps are being taken at multiple scales to mitigate species population problems related to human use of lands. However, in this new age of environmental awareness, advanced technology, and information overload, how do administrators, field managers, and policy-makers decide what

methods, management designs, and institutional policies will be most effective in conserving multiple species with diverse habitat needs such as neotropical migratory birds? And how do scientists select the most critical problems in conservation research to address?

As human demands on natural resources continue to grow, and availability of native habitats for preserving biological diversity continues to decline, the necessity for increased communication between researchers and land managers has become painfully clear. Solutions for the complex environmental problems that now exist at local, national, and global scales may remain out of our reach if land managers and researchers continue to think and work apart (Davis and Ehorn 1988), divided by professional subcultures even within the same organizations. By clarifying and prioritizing management needs for research, managers can influence research direction. Likewise, research knowledge, when designed and communicated in ways that have meaning to managers, can guide management planning, prescriptions, and policy. To communicate effectively, then, resource managers and researchers must develop a common language built on mutual interest in sustaining the components and ecological linkages of natural ecosystems. This means asking the right questions; discovering scientifically-valid solutions to resource management problems; making responsible decisions that are attuned to socioeconomic factors; and implementing collaborative processes of change for a sustainable future.

---

<sup>1</sup> Deborah M. Finch, Rocky Mountain Forest and Range Experiment Station, Forestry Sciences Laboratory, 2500 S. Pine Knoll Drive, Flagstaff, AZ 86001.

<sup>2</sup> Marcia Patton-Mallory, Rocky Mountain Forest and Range Experiment Station, 240 West Prospect Street, Fort Collins, CO 80526.

A leading example of this kind of integrated, interactive approach to conservation is the ground-breaking program, *Partners in Flight*. Owing to the participatory nature of *Partners in Flight*, managers and scientists interested in conserving neotropical migratory birds and their habitats have opportunities to communicate and cooperate across geographical, educational, professional, and cultural boundaries. Volunteer committees and working groups of *Partners in Flight* are developed at international, national, and state levels to facilitate communication among representatives of special interest groups, agencies, and academic specialties, including ornithologists, ecologists, forest and range managers, conservationists, industry representatives, economists, educators, and extension specialists. This conference was designed to celebrate these partnerships, and especially to focus on the need for managers and researchers to communicate more often and more effectively across habitual barriers. The most important principle underlying the goals of this workshop is the notion that conservation solutions and strategies are more powerful and sound when different minds think together than when they think in isolation.

The objectives of our paper are to evaluate the reasons for the traditional gap between research and management and to identify mechanisms that help to bridge the gap. We suggest proactive steps to advance communication and describe a variety of tools to enhance the sharing, use, and value of information, particularly within the context of *Partners in Flight*.

### WHY DOES THE GAP EXIST?

The research profession is in a state of transition in many government agencies, as scientists shift their emphasis from functional, single-resource studies to interdisciplinary, multi-resource team approaches (Montrey 1991). In academia, researchers in natural resource and biological disciplines are also expanding their emphasis, incorporating applied aspects to basic research designs, as evidenced by the proliferation of applied journals (e.g., *Ecological Applications*, *Conservation Biology*, and *Landscape Ecology*, to name a few). These philosophical shifts are related to 1) the public's increasing involvement in land management issues and their vocal demands that natural resources be sustained for future generations, 2) growing environmental problems and the need to find integrated, scientifically-valid solutions, and 3) increased informational needs of land managers who are challenged by the public and the problems.

What factors have inhibited communication between managers and researchers to begin with? While the answer is complex, it depends to some extent on historical limitations in technological communication - as knowledge has progressed, the ability to transmit, find, and apply research results has often been limited to those who can afford to travel widely to meetings or who have access to university libraries. Field managers living in remote localities (e.g., National Parks, Forests, and Refuges) have often been hampered from promptly retrieving new

information due to financial and logistical constraints. It is now easier for communication to transcend geographical boundaries because our technological capability allows us to access knowledge via electronic bulletin boards, computerized information retrieval systems, and publication circulation networks. Even though technology now provides the means for complex communication networks, the gap remains. Part of the problem is that the language used by researchers frequently differs from that used by resource managers - both groups have complicated jargon that only insiders can fully understand. In addition, research may often be too basic or simplistic to supply the informational needs of land managers. More to the point, as Montrey (1991) candidly remarks, "we (researchers) didn't do a good enough job of telling our story, and more importantly, we didn't do a good enough job of listening to those whose lands these are." It is our view also that land managers have not always done a good job explaining their needs or soliciting research help.

Nicholls and Prey (1982) propose several factors that inhibit successful technology transfer, including inadequate funding, attitude, red tape, legal restrictions, and managerial resistance. In addition, there is often a time lag of 10-15 years from the time research begins until results are used (Callaham 1981). Within the wildlife biology profession, we believe the following considerations are most important in explaining why the transfer of information from researchers to managers fails:

- 1) Research results are typically scattered and fragmented across various publications and usually not in a form that is readily usable by managers. It takes a resource specialist to carefully synthesize and distill information into a useful package of management recommendations that can be implemented in the field.
- 2) We don't have a good process for identifying and prioritizing real gaps that do exist in our current state of knowledge. Such a process should include a framework where future research results can easily be incorporated with existing knowledge. This process should give guidelines for what is needed, when, why, and how it should be gathered.
- 3) Some research information may be of little use to managers because the results are too narrowly focused. Researchers may have an unsophisticated or narrow understanding of management issues such that the guidelines they recommend are inappropriate or fit only a piece of the puzzle. To address complex natural resource issues, knowledge from many disciplines may be required

(Beissinger 1990). To effectively conserve neotropical migratory birds, for example, it is necessary to know how to manage populations within the context of land use patterns and practices, socioeconomic factors, natural events, complications of land ownership and state/country borders, financial constraints, and national and international policy. The "value" of a migratory bird species must be considered in relation to other species, land uses, and problems. The sheer magnitude of the geographic and temporal scales used by migratory birds i.e., summer breeding grounds in North America, spring/fall migration along broad fronts and narrow corridors, winter nonbreeding grounds in Latin America, produces additional hurdles in resolving management questions.

- 4) Working environments may create philosophical barriers between managers and researchers. Managers who must deal with political and economic realities in day-to-day decision-making sometime view researchers as naive or arrogant in their narrow focus or unwillingness to compromise. Researchers used to operating with more academic freedom, on the other hand, may criticize managers for not confronting resistance and embracing new concepts quickly enough. The difference between the lessons one learns in a university and the training one receives in an agency job can produce a rift between academic researchers and those graduates who have gone into natural resource management. Such ideological and psychological differences can produce breakdowns in communication.

## HOW DO WE BRIDGE THE GAP?

Because closing the gap between research and management is a shared responsibility, the mechanisms we identified apply to integrated activities that should be adopted by researchers and managers. Some of these ideas have already been implemented by government agencies, while others are more uniquely framed to address neotropical migratory birds.

First, managers should be involved early in the research planning process. Too often, researchers wait until the study is completed, then ask for review of manuscripts. Inviting users to be involved in the research planning process can advertise and extend the potential use of the results. The management

community will be more likely to accept the results if they participated in defining the research problem and approach. In the Forest Service, for example, a broad range of users and staff are invited to comment during the development of 5-year research plans. Supervisory reviews to discuss any needed changes in direction can also be scheduled periodically.

Second, significant management plans should be reviewed for scientific accuracy by research experts early in the planning process. For example, resource management audits conducted by the Florida Department of Natural Resources have proven to be an effective way to bridge the gap between the intent and implementation of park management plans (MacLaren 1992). Technical review of the *Partners in Flight* conservation scheme for prioritizing species of concern (Hunter et al., this proceedings) is another example.

Third, information about neotropical migratory birds should be systematically shared so that issues larger than those addressed by the original study can be explored. Marx (1980) described general steps for transferring technology that are useful in a broader sense, such as matching the information to the target user group, developing an application plan, packaging the information in a useable form, selecting effective transfer media, bringing specialists and users together, arranging for troubleshooting and feedback, and evaluating the transfer process and results. Information-sharing networks and processes can be developed using media such as in-house and program-oriented newsletters, electronic mail lists and bulletin boards, subject-matter working groups, training workshops, research/management conferences, regional meetings, show-me trips, slide tape programs, publication distribution systems, and project directories. Monitoring data (e.g., bird census data, nest records, habitat inventories) can be accessed through data storage and retrieval systems, centralized data banks, and computerized data bases. Financial support for information-sharing strategies is essential to their success. Other considerations include ease of transfer, user demand and marketability, ease of application, time and personnel resources, compatibility with ongoing management methods, and degree of benefit to the user (Nicholls and Prey 1982).

Fourth, organizations need to prioritize research, monitoring, and management questions, and focus efforts on critical problems. Needs for long-term monitoring and analysis must be balanced against studies that address specific short-term issues. Where answers require consolidation of findings across specialties, multidisciplinary teams should be formed.

Fifth, researchers and research organizations must ask themselves "Do we value technical assistance as much as published research?" How willing are we as researchers to commit the time necessary for effective technical assistance when, under current performance evaluation standards, it may reduce our likelihood of achieving promotions or academic tenure? How willing are we as managers to commit the time to explore what new information is available or to commit the resources to replace existing technology? Overcoming these barriers will require that organizations develop procedures for

rewarding technical assistance and management renovation. For example, credit for technical assistance and management consultations can be designed into: annual performance evaluations, research panel and tenure reviews, and cash awards. If one measure of research success is the number of problems solved (Nicholls and Prey 1982), then highlighting solutions via technology transfer will improve research value and researcher credibility.

A sixth mechanism for bridging the gap is to use demonstration areas or projects. The broad geographic concerns of migratory birds require application of knowledge across diverse habitats, ranging from boreal forests to agricultural landscapes to tropical rainforests. As demonstration areas are initiated to teach broader concepts of sustainable ecosystems, the valuable roles that neotropical migratory birds play within ecosystems should be explicitly described. For example, expanding agroforestry demonstration projects to include neotropical migratory birds can effectively capitalize on ongoing efforts.

## PARTNERS IN FLIGHT

*Partners In Flight* working groups are developing a full network for communicating and sharing technical information. Regional working groups (Southeast, Northeast, Midwest, West, International, and Caribbean) simultaneously address management and research components under a united umbrella. To ensure greater local participation in *Partners In Flight*, state working groups have also been chartered. Technical working groups (Research, Monitoring, Information and Education) transfer new information, publications, and needs assessments throughout the *Partners in Flight* framework.

An important mandate of the Information and Education Working Group is to convey technical materials to *Partners in Flight* participants. Such materials have included slide/tape shows, brochures, news items, popular articles, videotapes, and symposia. The *Partners in Flight* Newsletter published by the National Fish and Wildlife Foundation centralizes program participation and provides a fundamental network for sharing information across disciplines and geographic boundaries. The real key here is recognizing the difference between data overload and useful information, and taking the time to package the information to serve its intended audience.

This training workshop for *Partners in Flight* exemplifies several ways of enhancing communication and transferring information:

- one-to-one and group interactions that brought researchers and managers with similar and differing viewpoints together.
- concurrent problem sessions and regional think tanks so that important issues could be addressed through group consensus processes.

- impromptu working group gatherings and organizational meetings and socials.
- oral presentations by invited speakers from multiple disciplines who were asked to review and synthesize research and management findings.
- panel presentations that allowed time for panelist and audience interactions.
- poster presentations that transferred new research and management information to workshop participants.
- videotaped interviews of various workshop participants and presenters.
- publication of this proceedings that outlines management recommendations and guidelines for conserving neotropical migratory birds.
- publication of a book that reviews and synthesizes research information to support management recommendations.

## SUMMARY

The gap between research and management can be bridged by a number of mechanisms that encourage both researchers and managers to go beyond the traditional boundaries of their professions. We can no longer afford to detach ourselves from our colleagues by using words like "this is the problem I need solved" or "here are the research data." Patterns of language and vehicles for sharing information must be developed that transcend historical and habitual barriers in communication. Researchers and resource managers need to commit the time and energy to create a shared knowledge of what is known within a framework that can be applied across organizations, disciplines, and partnerships. We believe that *Partners in Flight*, a program that is geographically and hierarchically scaled to meet the concerns of all its participants, has provided such a framework for the conservation of neotropical migratory birds.

## ACKNOWLEDGMENTS

We thank Kay Franzreb, Mike Marcus, Tom Nicholls, and Peter Stangel for their reviews of this paper.

## LITERATURE CITED

- Beissinger, S.R. 1990. On the limits and directions of conservation biology. *BioScience* 40:456-457.
- Brown, G.A., and C.C. Harris. 1990. The U.S. Forest Service; Towards a new resource management paradigm. Moscow: Department of Resource, Recreation, and Tourism, University of Idaho.

- Callaham, R.Z. 1981. Criteria for deciding about forestry research programs. U.S.D.A Forest Service, Washington Office, Washington, D.C. General Technical Report W0-29. 52 pp.
- Davis, G.E., and W.H. Ehorn. 1988. Science and management in U.S. National Parks. *Bull. Ecol. Soc. Am.* 69: 111-114.
- MacLaren, P.A. 1992. Bridging the gap between biologists and managers - Resource management audits. Pp. 181-184 in Willison, J.H., Bondrup-Nielsen, S., Drysdale, C., Herman, T.B., Munro, N.W.P., and Pollock, T.L. (eds.) *Science and the management of protected areas*. Reprinted in *Developments in Landscape Management and Urban Planning* 7.
- Marx, H.G. 1980. Guide to help develop a technology transfer plan. U.S.D.A. Forest Service, Washington, D.C. 26 pp.
- Montrey, H. 1991. Forest Service research in the Southwest: Reflections and projections. Pp. 34-36 in D.C. Hayes, J.S. Bumstead, M.T. Richards (eds.), *A Southwestern Mosaic: Proceedings of the Southwestern Region New Perspectives University Colloquium*. U.S.D.A. Forest Service, Rocky Mountain Forest and Range Experiment Station, Fort Collins, CO. General Technical Report RM-216.
- Nicholls, T.H., and A.J. Prey. 1982. Providing information: Researchers to Practitioners. Pp. 156-162, in Parks, B.O., F.A. Fear, M.T. Lambur, and G.A. Simmons, *Urban and suburban tress: Pest problems, needs, prospects, and solutions*. Kellogg Center for Continuing Education, Michigan State University, East Lansing, MI.
- Salwasser, H. 1991. New perspectives in managing the national forests and grasslands. *Environmental Planning Quarterly* 8:8-9.