Natural Resources Research Program (NRRP)

Strategy Task Force

September 1994
FINAL REPORT

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INTRODUCTION

The Natural Resources Research Program (NRRP) was established to improve the effectiveness and efficiency with which the Corps delivers recreation and natural resource related services to the public. Over the years, the focus of work selected for funding in the NRRP has been primarily in areas of applied recreation. This focus reflects the immediate interest of natural resource managers in obtaining "solutions" for existing "problems". Extensive work has been performed more recently in the areas of economic impacts and recreation data management. Very little has been accomplished addressing the social aspects of recreation and natural resources.

Much has changed in the environment of the Corps Natural Resource Management (NRM) program since the inception of the NRRP. Legislated requirements, legislative authorities, natural environmental changes, increased and diversified competing demands for public resources, conflicting user demands, demographic changes in both users and potential users, shrinking federal budgets, increased emphasis on non-federal partners, the national economic climate, and many other factors all combine to create a rapidly changing, complex arena in which to accomplish public lands management programs in the public interest.

It is increasingly critical that we in the Corps accurately forecast changes in the physical, economic, social and political environment and develop insight and technologies equal to their challenges. Our success in this endeavor will hinge, at least in part, upon our ability to communicate and cooperate effectively with the recreation, natural resource, and research communities at large.

To this end, the NRRP Strategy Task Force was established in July 1992 to engage in strategic planning for the future of the NRRP. This is the report of findings and recommendations from that task force. Task force members included:

*Dr. Andy Anderson, NRRP Program Manager, Waterways Experiment Station

Mr. Lewis Decell, Manager, ERRAP, Waterways Experiment Station
Ms. Susan Whittington, Chief, Natural Resources Management Division, South Atlantic Division
Mr. Donald Dunwoody, Chief, Natural Resources Management Branch, Missouri River Division
Mr. Michael Ensch, Chief, Natural Resources Management Branch, Fort Worth District
Mr. Jim Shiner, Project Manager, John W. Flannagan Dam & Reservoir Huntington District
*Ms. Judith Rice, Outdoor Recreation Planner, Natural Resources Management Branch, HQUSACE

* Dr. Anderson served as Chair of the task force until his retirement from the Corps in October 1992. Ms. Rice subsequently assumed the duties of the Chair, and Mr. Lewis Decell represented WES interests on the group.

I. History and Summary of the Natural Resources Management Program

The U.S. Army Corps of Engineers was officially established by Congress in May 1779. Early Corps missions were totally military in nature. However, in 1824, Congress provided the Corps its first appropriation for work in navigable waters. The first reservoirs constructed by the Corps were begun in the 1880's at the headwaters of the Mississippi River. It took until 1932, though, for Congress to broaden the scope of the Corps work to include waterways used by non-commercial vessels and other flood control activities. The Flood Control Act of 1936 declared flood control to be a proper Federal interest, setting out requirements for local cooperation in flood control projects.

The development of Corps lakes nationwide soon attracted so many visitors that Congress began to include recreation and fish and wildlife management as project purposes in newly authorized projects. The Flood Control Act of 1944 gave the Corps specific authority to provide public outdoor recreation facilities at these projects. Master plans for the administration and development of project lands and waters were soon being prepared for these new lakes. Partnerships with state and local agencies for management of both lands and recreation amenities were recognized as beneficial, with the understanding that full participation might not be possible given the potentially limited capabilities of the partnering agency.

Continued national growth, with its attendant increase in disposable income and leisure time, resulted in increased public pressures on these newly developed resources. Improved roads and increased mobility triggered development around the once rural lakes, and many people purchased properties adjacent to these public lands. Due to the narrow Federal estate that was traditionally acquired by the Corps at its lakes and the lax on-site management by the Corps, adjacent property owners began to engage public land for private uses. During the 1950's and early 1960's, these uses did not receive much attention from the Corps. However, mounting public demands for use and/or protection of the resources resulted in a change of philosophy, and guidance issued in 1971 discouraged private exclusive use of public lands. In 1974, the Corps implemented a Lakeshore Management Program,

subsequently renamed the Shoreline Management Program, bringing under regulation all existing and future private facilities.

Although the Corps has provided high-quality recreation services to the public over the years, pressure to fund the development and O&M of recreation facilities and areas from non-Corps sources has existed for several years. Attempts have been made to shift the financial responsibility of providing these services to non-Federal agencies and the private sector. Since 1944, active involvement of state and local agencies in carrying out the recreation mission at Corps lakes has been underway. Today, non-Federal interests manage fully 47 percent of developed recreation areas at Corps lakes.

Currently, the Corps administers approximately 11.7 million acres of land and water at 463 lakes and waterways in 43 states. Of the 4,300 recreation areas on Corps projects, 2,500 are managed by the Corps; the remainder are managed by other Federal agencies, state or local governments, quasi-public entities or concessionaires. Public use has increased dramatically over the past four decades, growing from 30 million recreation days of use in 1952 to over 501 million recreation days by 1987 and paralleling national trends in this area. In FY 1992, Corps expenditures for recreation were $174 million, approximately 10% of the Corps overall Operations and Maintenance, General, appropriation.

II. History and Summary of the NRRP

Pursuant to the evolution, expansion and increasing complexity of the Corps Natural Resources Management program through the years, was the realization of the need for research to support NRM activities. In May 1975, the Deputy Director of Civil Works requested assistance from the Director, Institute of Water Resources (IWR), in developing a comprehensive, five-year Recreation Research Program (RRP) which would support the planning, design, construction, maintenance, and operation of Corps operated recreation and related natural resource areas. IWR was requested to assemble an ad hoc group of experts in the field of recreation and natural resources to assist in the identification and definition of research needs.

This request resulted in a May 1976 report to the Deputy Director of Civil Works prepared by IWR with the assistance of a Corps Advisory Group and in coordination with the U.S. Department of the Interior, Bureau of Outdoor Recreation. The report presents a) documentation of the need for a formalized research program to support the Corps recreation and natural resource management functions, b) identification and prioritization of researchable problems, c) alternative program proposals (minimum, optimal, and maximum), and d) recommendations for the implementation and assignment of management responsibility. The Recreation Research Program was subsequently approved with a Technical Monitor assigned from Operations Division in the Civil Works Directorate at HQUSACE. Waterways Experiment Station was assigned responsibility for RRP management.

The identification of recreation/natural resource management problems and the preparation of research recommendations from the 1976 study were based on several assumptions. One was that the Corps would continue its role in the development and operation of recreation facilities at its projects. While it was recognized that existing executive and legislative policies require the cost sharing of recreation development and the assumption of administrative responsibilities by non-Federal interests, it was assumed for the purpose of this study that most prevailing recreation and natural resources management problems would continue to be the province of the Corps. Another was the recognition that problems inherent in the NRM program were not the sole concern of the Corps Construction/Operations function,

but that the planning and design functions, as initial contributors to the development of NRM programs, had a major role in the agency's overall natural resources management responsibilities. Lastly, because of the unique nature of the Corps recreation plant with respect to the physical, natural and locational characteristics of its projects, it was assumed that management problems also tend to be somewhat unique and require specialized approaches to research.

Researchable problems were identified in the general areas of (1) recreation and natural resources management, (2) planning and design, (3) cost-sharing, (4) economic aspects of recreation, (5) social impacts of recreation, and (6) data management. Thirty specific research projects were defined within these general problem areas, varying from one to five years in duration.

Planning for the effective management of the RRP was considered as important as the conduct of the research itself. Important elements of this effective management were identified to be: (1) continued responsiveness to the needs and interests of the research user, (2) dissemination of research results, (3) translation of research results into new policies, procedures and methodologies for feedback into the NRM program, and (4) evaluation of the research program and identification of future research needs.

The purpose of the RRP, as stated at its inception, was "to expand knowledge and understanding of problems encountered to improve the effectiveness and efficiency of the Corps in managing natural resources while providing outdoor recreation opportunities at its water resources development projects." Research, in this case, was considered primarily as a service function to the planner and resource manager. Its function was to make knowledge accessible to the planning and the management processes. Its success was to be measured in the use of knowledge, rather than the production of reports or other publications.

Subsequent to the initial establishment of the RRP, a second Technical Monitor position was established in the Planning Division of Civil Works. The Planning Division Technical Monitor works with the Operations Division Technical Monitor to assure research efforts are fully integrated to support both planning

and operations elements.

Partially as a result of the May 1976 report and pursuant to subsequent considerations, the RRP was re-established as the Natural Resources Research Program (NRRP) in 1982.

ER 70-2-7, dated 1 April 1981, established a system of Recreation Research and Demonstration Units, a set of Civil Works projects designated for use as permanent outdoor laboratories for the NRRP. The system has been used to varying degrees over the years as a vehicle for directly testing and demonstrating the results of research efforts. The benefits of the Research Demonstration System (RDS), as it is now known, are (1) the enhancement of both the quality and timeliness of research, (2) the opportunity to test design and management alternatives in a controlled, but quasi-experimental setting, (3) provision of an improved basis to integrate research findings into the Corps NRM program, and (4) realization of important training, demonstration and public relations benefits.

An important element of the overall NRRP is the Natural Resources Technical Support (NRTS) program. NRTS became operational in March 1987 and provides supplemental assistance to the NRRP in facilitating rapid technology transfer of research related products and information to field NRM managers. This is accomplished through several activities: technical assistance to field managers for specific problems; technology maintenance, such as software maintenance; technology transfer through the use of workshops, newsletters, demonstrations, and similar vehicles, and special projects. NRTS has become more fully integrated in the NRRP in recent years and provides important flexibility in meeting managers needs quickly and effectively.

Draft ER 70-2-6 provides guidance for the management of the Corps Civil Works research and development program. It describes the elements of Corps Civil Works research programs, responsibilities of organizational elements, and guidance on program development. The functions of the Field Review Group (FRG) and the Technical Monitors are also presented in the regulation. Current FRG membership in the NRRP consists of 11 persons, one from the Operations element of each Major Subordinate Command, with one additional member from the Planning element in North Pacific Division. Additionally, district points of contact have also

been identified. The FRG members and district POCs represent the interests of both the Planning and Operations elements from their respective organizations. Their primary function is to assure the program is responsive to field needs and provides support as required to the on-the-ground natural resource manager.

The current budget for the NRRP is approximately $800,000 per year. This funding level is expected to remain fairly stable for the next few budget cycles. Accordingly, most new research work will be initiated only when ongoing research projects are completed.

III. Mission of the Task Force

The task force was established to engage in strategic planning for the future of the NRRP, for the purpose of:

1. Identifying major trends in the recreation and natural resource environment which have the potential for the greatest impact on Corps projects;
2. Determining focus areas for future research, to develop agency insight and available technologies to accommodate identified trends;
3. Identifying effective avenues for sharing research products and information within the Corps, as well as within the research community at large, particularly among federal land management agencies, to maximize research benefits.

Early in its deliberations, the task force identified a need for statements of purpose for the NRM program and the NRRP. A copy of the Mission Statement for the Corps Civil Works NRM Program, based on a version developed in 1991 by a select group of Corps NRM professionals, is attached as Appendix A to this report. The statement, although reflecting a consensus of Corps NRM managers, was not approved at the time the task force was working. As there was no approved mission statement for the Corps natural resources program, the task force adopted the following "background statement" to focus its efforts.

> The U.S. Army Corps of Engineers Natural Resources Management Program manages, conserves and improves natural resources and the environment while providing quality outdoor recreation to serve the needs of present and future generations.

Similarly, an updated statement of purpose for the NRRP was considered vital to the task force's deliberations. To this end, the following statement was developed.

> The NRRP develops and provides improved methods and techniques addressing issues of significant importance and scope in support of the Corps of Engineers nationwide recreation and natural resources program.

This statement is considered defining for the NRRP task force efforts and will be operative for the period the strategy is in effect.

IV. Assumptions/Emerging Issues/Issue Areas

The task force met in a series of three strategic planning sessions over the course of a year. Task force members collected data and solicited input from Corps elements and outside agencies and organizations, both initially and as interim work products were derived. To begin their efforts, the task force predicated their deliberations upon twelve basic assumptions.

1. We are working with a finite land base.
2. The Operations and Maintenance, General, appropriation will be stable or decreasing.
3. We will continue to focus on partnerships in daily business.
4. Manpower resources will continue to shrink.
5. There will be a continued Corps role in recreation and natural resources management.
6. There will be increased oversight of our programs, from the public, from other agencies, and from within our own agency.
7. There will be increasing environmental requirements imposed upon the work we do, both from a compliance and a mitigation standpoint, and there will be increased public interest and involvement due to improved awareness of these environmental requirements.
8. There will be increased scrutiny of many of our activities by outside interests, including the public at large.
9. The population (our users) will be constantly changing.
10. There will be changes in both the recreation and natural resource use of our projects.
11. There will be changes in the accepted uses of, and policies toward the use of, project lands.
12. We will experience increased resource use conflicts.

From these twelve basic assumptions regarding the Corps NRM activities and the environment in which we conduct them, the task force developed a lengthy list of emerging issues that have potential to impact significantly on the Corps NRM program. These twenty-one emerging issues, in random order, were:

1. Aging population.

2. Increasing retirement age.
3. Disposable income changes (likely decreasing).
4. Changes in the family "unit."
5. Increasing cultural and ethnic diversity.
6. Leisure time changes (likely decreasing).
7. Increase in indigent populations.
8. Environmental considerations.
9. Increasing development around projects, with resultant use conflicts.
10. Emphasis on bio-diversity and eco-systems management.
11. Fiscal deficits -- federal, state, local.
12. Water consumption/demands for water/water quality.
13. Non-traditional demands for land and water resources.
14. Threatened and endangered species.
15. Cultural resources (protection).
16. New recreational activities or pursuits.
17. Exceeding carrying capacities (social and resource).
18. Exotic species (introduction/impacts).
19. Demand for outdoor/environmental education/ interpretation.
20. Cost sharing.
21. Changes in energy consumption.

It was from this list of emerging issues that the task force developed a first cut of thirteen broad issue areas which could impact on our program and for which appropriate research could provide assistance. These issue areas (IAs) are:

1. Changes in Demographics and Customer Profiles.
2. Changes in Demand/Use for Land and Water Resources.
3. External Pressure on Project Resources.
4. Environmental Considerations.
5. Changing Approach to Management of Natural Resources.
6. Fiscal Realities.
7. Water Issues.
8. Archeological, Historical and Cultural Awareness.
9. User Oriented Communication/Interaction.
10. Approaches to Partnering.
11. Aging Infrastructure.
12. Changing Role of Natural Resources Managers and Staff.

Changes in Demographics and Customer Profiles. Americans, the primary universe of our potential visitors and the ultimate

owners of the public lands we administer, are changing. We are becoming older, better educated, more culturally diverse, and more environmentally aware. We own more toys, have less free time, have fewer children, and more disposable income. As we change, our preferences for recreation facilities and services change, as do our behaviors while in the recreation setting. Our philosophy regarding the appropriate use of natural resources changes, as does our understanding of the benefits we derive from them. These changes in both current and potential users will impact the manner in which the Corps provides NRM services in the public interest.

Changes in Demand/Use for Land and Water Resources. The Corps manages a finite land base for recreation and natural resources management purposes. Demands on that land base change as population increases and shifts occur, as adjacent activities (such as industrial, mining, agriculture, etc.) change, as environmental changes occur, as perimeter lands are developed for various purposes, and for other similar reasons. An increasing emphasis on water issues, particularly in western states, will increase demand for project waters for various uses by diverse interests. Non-traditional demands for land and water resources may emerge as national and local economies, American culture, and private industry change. These changes will create pressures on project land and water resources, challenging our resource managers to evaluate competing demands to assure the most appropriate use of the public lands we manage.

External Pressure on Project Resources. Unlike changing demand for on-project resources, this IA focuses on external pressures which impact both directly and indirectly upon the project's resources. Typically, the Corps has limited or no authority to control the cause of these pressures; however, in many cases, we must devise strategies to alleviate or mitigate any adverse impacts. Examples of such pressures include 1) impacts of pollutants from off-site uses, such as acidic mine drainage or airborne dust or fumes, 2) repercussion from local socio-economic issues, such as indigent populations using free campgrounds to the exclusion of other users, or 3) the theft or poaching of marketable resources to supplement the fiscal and dietary needs of a poor population. Examples of other external pressures might include 1) regulatory activities by other governmental entities, such as adjacent zoning requirements, 2) stringent environmental

controls on various activities, 3) changes in transportation routing through adjacent properties, or 4) something seemingly as simple as the vigorous posting of "no trespassing" by a neighbor on a long stretch of project boundary. Although these activities occur off-project, they may impact directly on our management of project resources and present increasingly significant management challenges.

Environmental Considerations. Basic environmental requirements have existed since the passage of several environmental laws in the 1970's. However, environmental legislation, and the public scrutiny surrounding this legislation, has increased significantly in the 1980's and 1990's, as has the body of regulations implementing these laws. The array of environmental considerations is increasingly large and complex and requires increasing attention to assure our responsibilities are fulfilled. All facilities must be operated in compliance with the full range of pertinent environmental laws. Periodic compliance assessments must be completed to determine the status of compliance and identify necessary corrective actions. Mitigation activities, whether from unfulfilled prior commitments or the result of new, large-scale development, require our attention. Lastly and importantly, increased environmental awareness throughout the general population has led to increased interest in our operations, even the "routine" ones, such as timber harvest, pest management or aquatic plant control. The concerns and demands of the general public will contribute to our identification of acceptable operations strategies in the future.

Changing Approach to Management of Natural Resources. Current public awareness of global environmental issues foreshadows an increased scrutiny of the manner in which we manage our natural resources. Pressure will be exerted on the Corps to incorporate such concepts as eco-systems management, maintenance and enhancement of bio-diversity, and recognition of bio-geocultural influences in our management philosophy. These concepts may radically modify the public's perception of what constitutes effective management of natural resources. Changes in populations, such as neo-tropic migratory bird and fresh water mussels species, may increase the significance of Corps management activities. Forest, fish and wildlife resources management may be integrated into unified, system-wide management plans, with endangered species protection continuing as a major

consideration associated with all work that we do.

Fiscal Realities. Fiscal constraints are a constant in public administration. O&M funding for civil works activities must compete with other national priority interests, as NRM program funding must compete with other civil works programs for O&M funding. Public demand for recreation opportunities, as well as the cost of providing those opportunities, is expected to continue to increase. Operating budgets, however, cannot reasonably be expected to increase commensurately. New and innovative ways to manage resulting fiscal constraints would be extremely welcome to Corps NRM managers at all levels, perhaps to include opportunities for participatory management, such as expanded challenge cost share and volunteer programs.

Water Issues. While the Corps basic authority to provide water for multiple purposes (i.e. hydropower, navigation, recreation) has not changed, competing demands for water and water quality have become major issues at many projects. As the steward of the resource, the Corps role is to provide for all authorized purposes through a balanced approach. The 1990's have seen the Corps management of these competing demands challenged in court. As a result, once uninvolved governments and special interest groups have become interested and are actively pursuing involvement in water management decisions. Additionally, as Corps lakes age and adjacent development increases, the potential for water quality problems also increases. Corps shorelands serve the role of filters between adjacent private lands and public waters for water quality and sedimentation purposes. The public and often the states, look to the Corps for leadership and action on water quality issues, such as water quality standards (both upstream and downstream) or controlling runoff from adjacent agricultural or industrial uses.

Archaeological, Historical and Cultural Awareness. Priorities for cultural resources lie within two basic levels of emphasis. The higher level concerns the legal priorities set in law or regulation. Requirements imposed by Section 110 and 106 of the National Historic Preservation Act, the Archeological Resources Protection Act, and the Native American Graves Protection and Repatriation Act are included in this category. The second level involves the day-to-day management of civil works projects, specifically land management activities such as timber harvest,

park development or rehabilitation, shoreline stablization, and wildlife management activities. Continuing emphasis will be placed on appropriate treatment of impacted cultural resources, to include curation of artifacts, development of educational and interpretive programs, site stabilization, and repatriation of human remains. As with all our IAs, public knowledge, interest and involvement can be expected to increase in the future in this area.

User Oriented Communication/Interaction. Federal agencies have long fostered the development of a public stewardship ethic in the users of public lands. This has been an effective educational effort, which increases volunteerism and public support for land management activities and, to some extent, reduces problem situations. At the same time, the general public is becoming more knowledgeable of the benefits of leisure, fitness and wellness. Corps policy and management activities must reflect an understanding of the benefits of leisure, as well as the existence value of the natural resources we manage. Demand is increasing for outdoor oriented, environmental educational programs. Further, an evolving public awareness and understanding of legislated requirements for Federal facilities, services and activities is expected to increase the interest and involvement of the public in our management activities. As local agencies, private entities and user groups become increasingly interested in public lands and associated activities, we must find ways to capitalize on the strengths of possible cooperative arrangements without abdicating our primary management responsibilities.

Approaches to Partnering. An increase in partnering, to include innovative types of partnerships, is expected to occur as a result of decreasing federal resources, increasing interest and involvement by the public in our programs, and the need for those benefiting from our resources to assist us in supporting that resource. Existing partnership vehicles will require intensive review and modification, challenging current concepts of responsibility and propriety, to become more efficient in meeting changing needs.

Aging Infrastructure. Our aging infrastructure could seriously affect our ability to maintain projects in an acceptably safe and sound condition to continue to fulfill authorized purposes. This

issue will impact our way of doing business for years to come, if only in terms of the fiscal impact it may have. In recent years, non-routine maintenance has been performed only as a result of breakdowns, frequently resulting in higher repair costs and extended downtime. A large majority of older recreation facilities are in serious need of rehabilitation. Well-designed, accessible and functional facilities are not only essential to public enjoyment, but also protect the natural environment, minimize the destructive effects of heavy use and ensure the health and safety of all visitors.

Changing Role of Natural Resources Managers and Staff. As managers of an increasingly complex program, natural resources managers and staff are finding their role to be commensurately complex and difficult. Corps NRM managers are now required to be conversant not only in generic recreation and natural resources matters, but also in technical environmental and highly charged cultural resources arenas. They must be highly skilled people managers, with well developed public relations skills. They must stretch increasingly limited budget and manpower resources across ever increasing requirements. They must be flexible enough to respond to new policy directives, while maintaining a practical, long term view of our agency. The role of Corps natural resources managers and staff becomes increasingly complex, as our responsibilities increase. Our ability to adapt effectively to that changing role will, at least in part, determine the future success of the Corps NRM program.

V. Research Focus Areas

Research focus areas (RFAs) were derived from the IAs and describe broad research categories which address the critical issues facing the NRM program. Some issue areas relate to several, if not most, RFAs. Research in the following areas will assist Corps resource managers in meeting the challenges posed by the changing social, physical and administrative environment in which they manage their programs. The RFAs are:

1. Management Systems/Techniques
2. Policy Effectiveness
3. Social Implications/Trends
4. Economic Effects
5. Environmental Considerations
6. Physical Facilities/Design
7. Natural Resources/Resource Systems
8. Identifying and Characterizing the Corps Role in Recreation and Natural Resource Management

Management Systems/Techniques. This RFA addresses the demand imposed on professional natural resource managers to be proficient and competent in a wide range of disciplines, not the least of which is resource (as opposed to natural resource) management. The identification, evaluation, modifying and development of management systems, philosophies, and techniques which improve the management discipline is an appropriate research focus for the NRRP.

Policy Effectiveness. Although a significant amount of effort and great emphasis is placed on the upfront development of agency policy, very little has been accomplished historically in reviewing the real effect of a policy once it is implemented. Did the policy accomplish what was intended? Did it have unanticipated effects or results? What were the public benefits? How can the policy be monitored and modified to improve its effectiveness and usefulness to the Corps? Research which facilitates formal and systematic review of policy effectiveness can provide the resource manager the tools to make critical course corrections.

Social Implications/Trends. Although the Corps resource base, including land, capital improvements and facilities, is expected

to remain fairly static, changes in demand and use resulting from social and demographic changes will continue to occur. Research which monitors these trends, forecasts their evolution, and predicts their impact on the Corps program will be invaluable in assuring demand is appropriately considered. Further, while Corps NRM activities are extremely popular with the public, it is essential that the basic benefits of these activities are known and understood by both those who set policy and allocate resources and the general public. Research activities in the United States, Europe, Australia, and especially Canada have identified specific, quantifiable benefits that the general public both understands and values. This information is also being used to make major policy and resource allocation decisions. The Corps should incorporate this knowledge into its planning, policy and resource allocation processes.

Economic Effects. Current fiscal realities indicate federal agency operating budgets and manpower allocations will continue to be lean. The impact of the federal deficit on the national economy will continue to affect the provision of recreation services and natural resource management at all levels - national, regional, and local - and by all providers - public, quasi-public, and private. Research which permits us to quantify the effect of our actions or proposed actions will provide the data needed to make well-founded decisions about alternative courses of action, as well as to document those decisions for review by oversight entities.

Environmental Considerations. The nation has become increasingly environmentally aware over the last decade. Laws and regulations mirroring this increased awareness have proliferated, and the state of the art in technical knowledge has advanced significantly. Public understanding of environmental issues has become a significant factor in the development of land use policies and the conduct of natural resources programs. Accordingly, Federal land management agencies in general, and the Corps specifically, have responded to the increasing requirements and scrutiny with a commensurate increase in focus on the environment. Research which clarifies environmental issues will provide needed assistance to the natural resource manager in understanding and integrating environmental considerations in the overall NRM program.

Physical Facilities/Design. Key to the Corps NRM program are the structures and facilities which support recreation and natural resource activities. Technological advances in facility design, construction and maintenance must be monitored and evaluated for use in the Corps environment. Research which provides this information to the on-site manager will provide immediate benefits in problem solving. This assistance can translate immediately into real savings of scarce dollars and unnecessary aggravation.

Natural Resources/Resource Systems. At the heart of the Corps NRM program are the natural resources systems which define our existence. These systems are the foundation for our stewardship responsibilities and provide the basis for all our management actions. Research which improves our understanding of eco-systems management, maintenance and enhancement of bio-diversity, and bio-geocultural influences is integral to our ability to manage effectively and responsibly.

Identifying and Communicating the Corps Role in Recreation and Natural Resources Management. The Corps NRM program is clearly and rapidly changing in response to changing conditions and demands in our operating environment. A clear understanding of our current niche in the nationwide recreation and natural resources community through a current, accurate assessment of the significance of the Corps water resources projects would be invaluable to our management program. Too many aspects of the environment in which we operate have changed over the years to assume that we should continue to do what we have always done. The Corps is one of the Nation's largest providers of outdoor recreation opportunities and the top provider of water-based recreation. We have historically attempted to accommodate most legitimate public demand on the public lands we manage. However, the realities of scarce fiscal resources and increasing demands on the natural resource base will dictate more selective accommodation in future years. A descriptive analysis of the scope and importance of the program to include an assessment of existing resources, the social and economic benefits deriving from those resources, and an understanding of our place within the community of Federal land managing agencies will assure decisions are informed, rational, and defendable.

A number of the IAs support several RFAs; however, the RFAs as

described above provide a framework for evaluating appropriate research topics, which will address our short- and long-term needs, provide relevant and usable products, and assure our scarce research resources are spent optimally. The overall direction of the NRRP can be monitored and managed through reference to these RFAs, while individual work units can be evaluated for propriety and priority by testing for applicability to the RFAs.

VI. Priority Areas

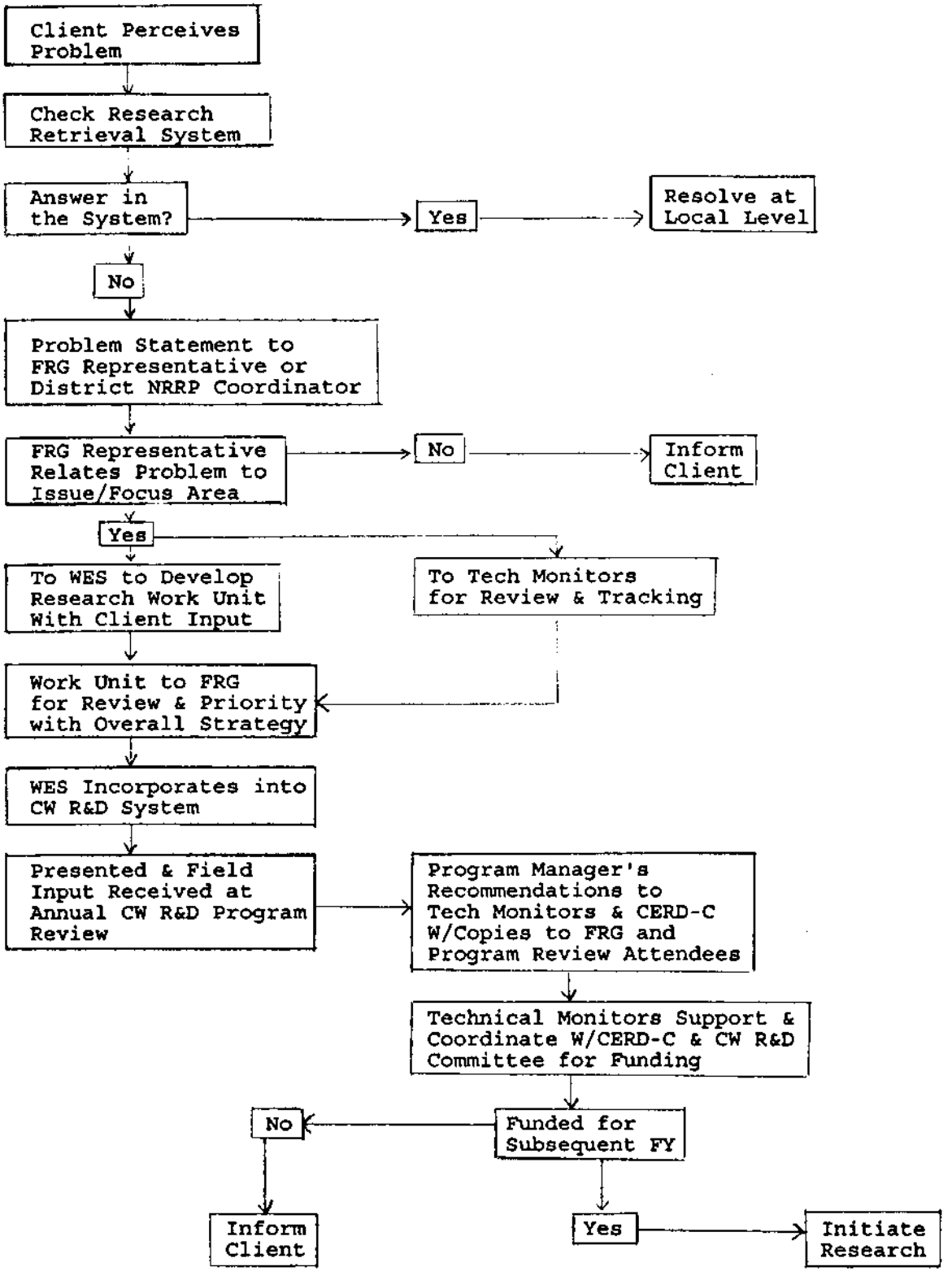
Three RFAs have been designated for priority research in the short term to direct NRRP resources and focus program attention most effectively. These priority RFAs were selected based upon overall task force discussions. They have been identified as most important to the Corps NRM program in the near term and deserve primary emphasis.

Social Implications/Trends. It is imperative that we know who our customers are, how they behave, what their preferences are, and what their demands will be on our land and water resources in order to address their concerns appropriately. Although we have some information about expressed demand from our current visitors, we have little information about latent demand from potential users who do not visit our projects but might were we to offer something they valued or desired. Nor do we have information about how our users in the future may differ from our current users and what their needs and demands might be in coming years. Without documenting this information, our future planning to accommodate that use will be based on professional opinion or "best guess". Faulty decisions can lead us into unwise expenditure of scarce resources and unsatisfactory performance in meeting customer demands. Additionally, Executive Order 12862, Setting Customer Service Standards, issued pursuant to the National Performance Review establishes some requirements to monitor and act on customer service issues. Understanding demographics and changing demands for land and water resources requires the establishment of baseline data and longitudinal monitoring. The need to begin this process dictates the priority nature of this emphasis area.

Natural Resources/Resource Systems. It is equally critical that we understand and monitor the natural resource systems which support our management actions. As natural resource environments become more scarce or limited in scope, effective public lands management becomes ever more critical. Smaller resource bases require more wise management practices; there is less tolerance for management error. Accordingly, we must improve our understanding of eco-systems management and the importance of bio-diversity, as well as maintaining emphasis on threatened and endangered species management.

Identifying and Characterizing the Corps Role in Recreation and Natural Resources Management. This RFA was identified as organic to our program and illustrates agency conflict regarding the appropriate role for the Corps now and in the future. We cannot continue to attempt to be everything for everyone. As customer demands for facilities, services and programs continue to expand, our resources to accommodate that demand remain constant or decrease. In order to assure we do the right thing well, we must determine what our appropriate niche is in the natural resources and recreation management community, based on our available resources, public expectations, and alternative available sources. We must identify and quantify our program outputs, in order to determine their significance on local, regional, and national levels. Then, we must communicate that information both within and outside the agency. This is considered a priority area for research, because it will assist in defining the Corps NRM program for the future. It will provide the basis for committing resources, for accepting or forgoing missions, for cooperating and coordinating with other NRM and recreation providers, and for assuring an integrated, rational approach directs our management activities.

VII. Flow Chart - Problem/Work Unit Process



VIII. Technology Transfer

Technology transfer is one of the more critical, as well as one of the more problematic, aspects of any research program. The technologies or knowledge obtained from a research project must be provided to the practitioner in a form that is understandable and usable. As stated in the original 1976 study for the RRP, the measure of success of the research program is in the use of the knowledge rather than in the production of reports. Effective communication between the researcher and the practitioner is required from project inception to product delivery to insure this success. If technology transfer is not successful, the research was pointless and the resources expended were wasted.

Although communication of problem solving information to practitioners essentially constitutes technology transfer, there are several components needed for an effective program.

Internal technology transfer occurs within the Corps. Work unit products developed by WES at the request of the NRM managers through the Directorate of Research and Development are provided to the field in a usable format. Assistance requested through the Natural Resources Technical Services (NRTS) program is provided by WES to the requesting manager directly, as well as to the Corps NRM community at large. Existing answers to perceived problems are investigated through the Corps research retrieval system and relayed to the client.

One element of the internal technology transfer process is the problem/work unit process described in Chapter VII of this report. This process begins the communication chain necessary to develop an appropriate plan for technology transfer of research work unit outcomes.

A technology transfer plan should be developed for each research work unit to assure the resulting technology is effectively delivered to potential users. The plan should be developed cooperatively by WES (the principal investigator), the Technical Monitor, and the targeted user. It should be a living document, which will be reevaluated and updated as the work unit progresses. The plan should address a series of activities as appropriate for the specific work unit. These activities may include:

1. Technology Demonstration. A demonstration of an innovation at a field site will make the technology visible to potential users. It should identify the benefit of the innovation, whether it be improved quality, time savings, or cost savings. It can also provide information on operational problems faced by users of the technology, as well as the effectiveness of proposed training and support mechanisms.

2. Packaging/Distribution. Packaging refers to the manner

in which the technology will be assembled for distribution and use by the practitioner. Decisions about whether to distribute the technology directly to potential users, upon request, or as part of a training course should be made and documented. The source of distribution, the packaging of instructional materials, and the procedures to package and distribute update materials should be addressed.

3. Customer Awareness/Promotion. Promotion activities designed to inform and motivate potential users to procure and implement a technology should be addressed. The goal is to provide sufficient information to assist the user in making an decision regarding acquiring the technology.

4. Support and Maintenance. The plan should consider options to provide assistance to users in implementing a new technology. A central source of assistance should be identified and staffing and resourcing requirements addressed, to the extent possible, in the plan.

5. Training. Appropriate training vehicles for the technology should be identified in the plan. Potential sources of training should be identified; the timing of training and the need for ongoing or advanced training should be addressed.

6. Cost and Schedule Summary. Once specific activities have been identified in the technology transfer plan, cost estimates and scheduling of those activities must be addressed. Funding requirements for the user, as well as those necessary to support the oversight and management of technology transfer activities should be included. Both one time and recurring costs should be shown. The cost and schedule summary should include a) the activity to be accomplished, b) who is responsible for the activity, c) the cost and source of funding for each activity, and d) a completion date.

External technology transfer involves the sharing of Corps developed research products and information within the research community at large, and conversely, the collection of research information from other sources for use by Corps managers. Although a very positive climate of cooperation and sharing is emerging among the Federal land management agencies, specific emphasis on the research component will be required to induce any meaningful improvement in inter-agency efforts in this area.

Several Corps conducted research programs, in addition to the NRRP, address issues related to natural resource management. Monitoring of these programs by FRG members could facilitate sharing of relevant information among users, as well as optimizing the benefit of the Corps investment in natural resource related research. Improved sharing of all Corps generated research related information, whether derived from the GI funded program, the NRTS program, or through reimbursable

activity, will improve the efficiency of the program. Open and consistent communication among key players - WES, the Technical Monitors, and the FRG - regarding findings about associated activities, perhaps through the use of RECNOTES, could significantly improve the utility and accessibility of available research information. An easily accessed computerized research retrieval system, incorporating information about Corps generated research as well as research external to the Corps, would facilitate NRM managers' searches for solutions.

IX. Recommendations

This report should be used as the overall guide for the NRRP for the foreseeable future. It should be revisited and updated at periodic intervals, determined by consensus of the FRG, to assure it remains current and viable. Three specific recommendations are made pursuant to the NRRP Strategy Task Force deliberations.

1. Decisions made regarding work unit identification, development, evaluation, and selection for funding should be made in accordance with the findings presented in this report. Proposals for new work should discuss the benefits of the work unit as they relate to the IAs, RFAs, and priority areas identified herein. All approved work units should relate directly back to the RFAs recommended in the report. Proposals for other work unit ideas will be accepted and evaluated, but priority consideration will be given to those proposals addressing research directly related to this report's findings.

2. The task force charge to identify technology transfer opportunities within the natural resources management research community at large proved too extensive for this task force to address. Two recommendations are provided relative to technology transfer.

a) A model for development of a technology transfer plan should be formalized for incorporation in the planning for every work unit. This model should include requirements for content, responsibilities, coordination, documentation, and schedule of initial plan development and updating. It is recommended a working group comprised of field NRM personnel and WES staff develop this model, with oversight by the Technical Monitors. The model should be presented to the FRG at the FY 96 NRRP Program Review for review and comment prior to final publication.

b) A working group should be established to investigate opportunities for external technology transfer. This investigation should include formal cooperative arrangements with other federal land management agencies, identification of various research libraries and databases to facilitate technical information searches (normally accomplished by WES in response to natural resource management problems), and other opportunities as appropriate. It is recommended WES coordinate this effort and report results to the NRRP Technical Monitors and the FRG at the FY 96 NRRP Program Review.

3. WES should develop a 5-year research and development plan in accordance with the findings described in this report. This R&D plan should focus on the priority areas identified in Chapter VI and will provide a basis for program management in the near term. The 5-year R&D plan will be provided to the FRG for review and comment, approved by HQUSACE, CECW-ON and CECW-PD, and released for general distribution to NRM and Planning elements.