U.S. DEPARTMENT OF COMMERCE
National Technical Information Service

AD-A034 144

STUDY OF LAND USE FOR RECREATION AND FISH AND WILDLIFE ENHANCEMENT MAIN REPORT

Coastal Zone Resources Corporation
Wilmington, North Carolina

May 1975

STUDY OF LAND USE FOR RECREATION AND FISH AND WILDLIFE ENHANCEMENT

Main Report

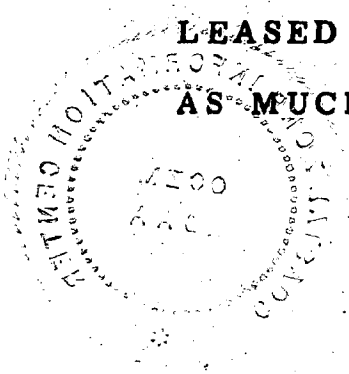
Submitted to
Office, Chief of Engineers
U.S. Army • Corps of Engineers

By
Coastal Zone Resources Corporation
Wilmington, North Carolina

May 1975

N O T I C E

THIS DOCUMENT HAS BEEN REPRODUCED FROM THE BEST COPY FURNISHED US BY THE SPONSORING AGENCY. ALTHOUGH IT IS RECOGNIZED THAT CERTAIN PORTIONS ARE ILLEGIBLE, IT IS BEING RELEASED IN THE INTEREST OF MAKING AVAILABLE AS MUCH INFORMATION AS POSSIBLE.



SECURITY CLASSIFICATION OF THIS PAGE *(When Data Entered)*

REPORT DOCUMENTATION PAGE

READ INSTRUCTIONS BEFORE COMPLETING FORM

1. REPORT NUMBER (6)	2. GOVT ACCESSION NO. / 3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle): Study of Land Use for Recreation and Fish and Wildlife Enhancement • MAIN REPORT •	5. TYPE OF REPORT & PERIOD COVERED (9) Final rept.
	6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s): COASTAL ZONE RESOURCES CORPORATION (15)	8. CONTRACT OR GRANT NUMBER(s): DACW 73-75-C-0001 NEW
9. PERFORMING ORGANIZATION NAME AND ADDRESS: Coastal Zone Resources Corporation Wilmington, North Carolina	10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS: Directed by: Public Law 93-251
11. CONTROLLING OFFICE NAME AND ADDRESS: Department of the Army Office of the Chief of Engineers; DAEN-CWO-R Washington, D.C. 20314	12. REPORT DATE (11) May 1975 / 13. NUMBER OF PAGES: 317 (1)
14. MONITORING AGENCY NAME & ADDRESS *(if different from Controlling Office)*	15. SECURITY CLASS.: Unclassified / 15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT *(of this Report)*

Distribution Statement A

17. DISTRIBUTION STATEMENT *(of the abstract entered in Block 20, if different from Report)*

18. SUPPLEMENTARY NOTES

19. KEY WORDS *(Continue on reverse side if necessary and identify by block number)*

LAND USE
RECREATION
FISH AND WILDLIFE

20. ABSTRACT *(Continue on reverse side if necessary and identify by block number)*

The report describes legislative authorities, policy direction, and land use practices of the U.S. Army Corps of Engineers. It identifies problems and makes recommendations for improved management of project resources.

A

DD FORM 1 JAN 73 1473 EDITION OF 1 NOV 65 IS OBSOLETE

SECURITY CLASSIFICATION OF TH...

STUDY OF LAND USE FOR RECREATION
AND
FISH AND WILDLIFE ENHANCEMENT

Submitted to
OFFICE, CHIEF OF ENGINEERS
U. S. ARMY
CORPS OF ENGINEERS

By
Coastal Zone Resources Corporation
Wilmington, North Carolina

May 1975
Text revised to reflect the comments
submitted by Federal agencies and
State governments
December 1975

ACKNOWLEDGEMENT

This report would not have been possible without active assistance rendered by hundreds of people interested in the wise use of the Nation's natural resources. The individuals who contributed include employees of the Corps of Engineers and other Federal agencies; officials of national citizens organizations; homeowners; staff persons of trade organizations; administrators and field employees of state agencies; independent businessmen; local government officials; and legislative budget analysts. Each took the time to consider and respond to questions and to provide documents, often with considerable effort, to shed light upon some aspect of the problem at hand.

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

Study of Land Use for Recreation and Fish and Wildlife Enhancement

Introduction

The increasing importance of recreation participation and development has raised questions about Corps of Engineers' (Corps) involvement in the provision of recreation opportunities. There has been and continues to be a sharp division of opinion about the role of an engineering agency in the recreation, fish, and wildlife fields. Recognizing the importance of this issue, the 93rd Congress enacted the following as Section 25 of the Water Resources Development Act of 1974 (PL 93-251):

> The Secretary of the Army, acting through the Chief of Engineers, is authorized and directed to study land use practices and recreational uses at water resource development projects under his jurisdiction, and to report thereon to the Congress not later than June 30, 1975, with recommendations as to the best use of such land for outdoor recreation, fish and wildlife enhancement, and related purposes.

In compliance with the above directive, the Office, Chief of Engineers (OCE) contracted with Coastal Zone Resources Corporation (CZRC) to perform the study summarized herein. The issue of fish and wildlife mitigation or compensation attached to the creation of each project was not specifically addressed. The study findings, conclusions, and recommendations were developed through the performance of the following tasks.

1. Review existing statutes and regulations which control the management of water resource development projects (WRDPs). Statutory and regulatory authorities were assembled by surveying the United States Code (USC) and relevant regulations issued by OCE.

2. *Review pertinent literature and national data.* Bibliographies were used to locate relevant reports and documents which were reviewed and referred to throughout the course of the study.

3. *Conduct field research.* Twenty-nine WRDPs were selected from among 407 projects nation-wide for intensive field study based upon the following criteria: geographic location, concentration of Corps activity, differences in land acquisition policies, complexity of shoreline management, area of water surface, relationships between the Corps and other Federal agencies -- including various management arrangements with the U. S. Forest Service under the terms of Memoranda of Understanding between the Secretaries of Agriculture and Army, relations between the Corps and State governments, urban versus rural setting, amount of land managed by the Corps, recreation visitor usage, interrelationships between recreation resources and other project purposes (such as flood control and navigation), and the complexity of real estate programs and practices.

A field team of 2 to 4 persons specialized in planning/administration and fish/wildlife biology visited each WRDP selected, the cognizant Engineer District, and relevant state agencies. At each WRDP site, Corps personnel and personnel from other Federal agencies and from state, local, and regional agencies were interviewed. When conditions permitted, local realtors, land owners, bankers, and officials of citizens groups, homeowners associations, and independent governmental agencies were also interviewed. In the Engineer District offices, interviews were held with personnel in the engineering, planning, operations, and real estate divisions and their respective branches and/or sections. At the state

level, personnel within state planning, fish and wildlife, parks and recreation, pollution control, and other recreation resource and environmental agencies were queried.

In addition to the surveys of selected WRDPs, agency profiles were developed for six Federal agencies [U. S. Forest Service (USFS), National Park Service (NPS), U. S. Fish and Wildlife Service (USF&WS), Bureau of Land Management (BLM), Bureau of Reclamation (BuRec), and the Tennessee Valley Authority (TVA)] and six state agencies [Washington State Parks and Recreation Commission, Texas Parks and Wildlife Commission, Pennsylvania Bureau of State Parks, Tennessee Wildlife Resources Agency, Missouri Conservation Commission, and Minnesota Department of Natural Resources] with responsibility for recreation, fish and wildlife, or natural resource management. Although not presented as agency profiles, discussions also were held with officials of the U. S. Bureau of Outdoor Recreation (BOR) and the Council on Environmental Quality (CEQ) in the Executive Office of the President.

Nearly 1,000 persons were interviewed during the field research phase of this study.

4. *Appraise Corps land use, recreation, and fish and wildlife management.* Key findings developed in the case studies provided a focal point for characterizing Corps WRDP administration, the extent of the resources, and their national importance.

5. *Project national needs.* Existing national policy statements and generalized demand forecasts for varying types of water-oriented recreation activities served as a

basis for a determination of national needs.

6. *Identify key problem areas.* Major areas of conflicting demands and management deficiencies discovered in the field investigation were identified and a suggested framework for their solution developed.

7. *Evaluate alternative solutions.* Four major possible solutions to existing management problems were evaluated: (1) sale or lease of WRDP land to the private sector; (2) transfer of WRDP land to the state governments and their political subdivisions; (3) transfer of WRDP land to other Federal agencies; and (4) continue administration of the lands and waters by the Corps. Each alternative was analyzed in terms of: (1) effectiveness in meeting the recreation-resources management responsibility associated with Corps WRDPs, (2) effect upon local tax structures, (3) effect upon national needs, (4) effect on programs of the Corps and other agencies, and (5) statutory, fiscal, and policy constraints.

8. *Recommend a course of action.* Based on all the preceding tasks, a recommended course of action was prepared for consideration by OCE.

A. Findings

1. General

a. The 407 existing Corps WRDPs constitute a nation-wide system of resource units comparable to the national park system, the national forest system, and the national wildlife refuge system.

(1) Forty-two of the forty-eight contiguous states contain one or more Corps WRDPs.

(2) Corps WRDPs occur within zones defined by landscape analysts as corridors of environmental quality. Lake size and diversity superimposed upon a high quality landscape provide an aesthetically attractive setting for all classes of water-oriented recreation.

(a) During 1973, Corps WRDPs in the contiguous states sustained 339 million recreation visits.

(b) The attractiveness of the WRDPs, created very largely at national expense, draws people from the date they are completed whether or not recreation is an authorized purpose.

b. The present Corps WRDP system contributes significantly to Federal, state, and local recreation and fish and wildlife inventories. Corps land comprises:

(1) Approximately 1.2% (378,028 acres) of the land in USF&WS refuges and game ranges.

(2) Approximately 8.6% (473,826 acres) of state park acreage and 9.1% (1,440,245 acres) of state fish and wildlife lands.

(3) Approximately 2.4% (22,412 acres) of the area in municipal park systems and 1.8% (23,061 acres) of the land in county recreation use.

c. The Corps has broad statutory authority to plan, develop, and operate public recreation facilities, manage forest resources, cooperate in fish and wildlife management, and permit private use and development of public land. The authority is permissive rather than directive.

(1) Corps recreation-resources management programs at WRDPs completed prior to 1965 are premised on Section 4, Flood Control Act of 1944 (16 USC §460d), the Fish and Wildlife Coordination Act (16 USC §663d), and Section 1, Flood Control Act of 1938 (33 USC §540). The acts authorize public park and recreation facilities but only require adequate provision for wildlife resources when consistent with primary project purposes.

(2) The Federal Water Project Recreation Act (16 USC §460ℓ-12) requires that full consideration be given to outdoor recreation at all WRDPs completed after 1965 and requires cost sharing by non-Federal participants.

(3) A portion of the Corps' legal framework consists of the Clean Air Act (42 USC §1857f), Federal Water Pollution Control Act Amendments of 1972 (33 USC §§1323, 1341(a) (1), and 1368(a)), the Solid Waste Disposal Act of 1965 (42 USC §3254e (a)(1) et. seq.), the National Environmental Policy Act of 1969 (42 USC §4332), other generally applicable Federal statutes, and Executive Order 11752 (3CFR 380).

d. Identified key problems associated with Corps administration of its WRDP system cannot be directly related to the age or size of projects, distances from urban areas, or amounts of land acquired.

e. Some of the key problems identified are not susceptible to a feasible solution at this time.

(1) At those WRDPs where the land authorized for acquisition has proven grossly insufficient, the cost of acquiring the necessary additional land would be prohibitive.

(2) The quality of water in some streams tributary to WRDPs has been degraded by complex sources of pollutants.

(3) The Corps has no control over the location and quality of main arterial access routes to WRDPs.

2. Outdoor Recreation

a. The water surface of Corps administrated WRDPs is not being used to full capacity, but problems of localized congestion and uneven distribution exist.

(1) Overall boating use does not now require density controls except for no-wake zones near marinas.

(2) Large numbers of floating docks and associated boat traffic limit fishing near shore at WRDPs such as Hartwell, Old Hickory, and Table Rock.

b. Corps field personnel provide safe and sanitary access to WRDPs and sometimes utilize innovative approaches to recreation management.

(1) The physical cleanliness and maintenance of Corps recreation facilities, particularly comfort stations, was rated excellent at 96.5% of the WRDPs.

(2) Rotation of facility use and variable bicycle trail locations are employed at the Hartwell WRDP, and self-guided nature trails have been developed at Old Hickory.

c. Insufficient qualified professional personnel are employed at the WRDP level to properly regulate the use of resources and facilities by visitors.

(1) Approximately 31 professional personnel have responsibility for 8,065 miles of shoreline, 867,819 acres of land, and 17.4 million visitor days of use at 17 WRDPs studied.

(2) Visitor occupancy is not limited to the design capacity of facilities at any Corps managed recreation area surveyed.

(3) Visitor protection is a problem at many Corps WRDPs and the problem is being evaluated separately as directed by Section 75 of the Water Resources Development Act of 1974 (PL 93-251).

d. The planning process is inadequate in one or more of the following areas:

(1) Some Corps administered recreation areas and facilities are overused (37.9% show physical site deterioration - soil erosion) and some are underused, sometimes at the same WRDP.

(2) The location of facilities and the design of facility layout are often incompatible with the capabilities of the natural resources.

(3) Changes in the character of recreation demand are not measured over time.

(4) Planning staffs cannot adequately evaluate impacts upon recreation and fish and wildlife from various water level and release regimens.

(5) Competition or complementarity of proximate private or public recreation facilities and services is not adequately considered.

(6) Corps planning does not adequately consider increasing winter use of northern WRDPs.

(7) The Corps rarely uses available data effectively to interpret the flora, fauna, geology, and history of WRDPs and their environs.

e. Site deterioration, including soil erosion, seems to be more pronounced at older WRDPs regardless of the amount of land that was authorized and acquired.

(1) Seventy-three percent of the WRDPs surveyed that were completed prior to 1953 displayed visible signs of site deterioration.

(2) Seventeen percent of WRDPs surveyed that were completed in 1953 or later exhibited visible signs of site deterioration.

3. Fish and Wildlife

a. Corps personnel at Engineer District and WRDP levels practice limited fish and wildlife management within the WRDPs in cooperation with state and Federal fish and wildlife agencies.

(1) The water level at some WRDPs such as Eufaula is manipulated to enhance fish nursery and waterfowl values.

(2) Peripheral vegetation is encouraged within some of the storage pools as food and cover for fish and wildlife.

(3) Release schedules and structures are modified to enhance or reduce damage to downstream fisheries.

(4) Where wildlife biologists are employed at WRDPs, meaningful wildlife habitat improvement programs have been initiated.

(5) The Corps has issued 217 instruments outgranting 1.8 million acres of land to fish and wildlife agencies.

b. The water bodies and shorelands of the Corps WRDP system are, for the most part, man-created environments which can be managed more intensively for fish and wildlife production than is now the case.

(1) Maintenance of constant water elevations during appropriate seasons increases the waterfowl carrying capacity at projects such as John Day; similar opportunities exist at WRDPs such as Pend Oreille.

(2) Wildlife habitat improvement programs at a few WRDPs, such as Clark Hill, are enhancing waterfowl, wild turkey, and other upland game populations.

(3) Approximately 31% of Corps WRDPs have converted downstream areas from warm-water fisheries to cold-water fisheries, the most notable example being Lake Taneycomo below Table Rock, but release of water thermally incompatible with needs of downstream biota is always possible.

c. Realization of the full fish and wildlife potential of Corps WRDPs has been hampered by lack of funds, qualified personnel, and policy direction.

(1) Conflicts between water elevations presently maintained and fish and waterfowl needs occur at 55.2% of Corps WRDPs.

(2) Corps solutions to fish and waterfowl problems emphasize structural modification and mechanical manipulation rather than resolving conflicts among competing resource uses.

(3) Corps WRDP personnel have not assumed strong coordinative leadership at interstate WRDPs even when requested to do so by state agencies.

(4) Corps programs emphasize water-oriented recreation rather than habitat enhancement and hunting.

(5) Fish and wildlife enhancement receive a low priority, usually below all other Corps programs.

(6) Structures and release mechanisms are not adequately designed to protect fishery values.

d. Lake fishery and waterfowl receive more attention than stream fisheries or upland wildlife.

(1) The quantity, quality, and timing of water releases downstream deserve increased attention at 27.6% of Corps WRDPs.

(2) Responsibility for fish and wildlife management is divided between the Corps and state and other Federal agencies with no clear leadership role established.

(3) Upland habitat management problems and underuse of potential exists at 75.9% of Corps WRDPs. Particularly noticeable is the lack of conscious planned wildlife management programs.

(4) At some WRDPs, so little emergent land was acquired that meaningful wildlife management activities are not possible.

e. Shortages of qualified professional personnel and funds extend to state fish and wildlife agencies that depend largely on dedicated revenue from user fees and license sales.

(1) The majority of state fish and wildlife expertise is concentrated in the headquarters staffs where one or two biologists may have responsibility for management

of all state game land and fisheries programs; single district biologists often administer total fish and wildlife programs in very large areas.

(2) Increases in present dedicated revenue sources have by and large not kept pace with decreases in purchasing power and state fish and wildlife agencies are reducing programs or seeking new sources of revenue.

4. Corps and Contiguous Land Use

a. The interrelationship between Corps and adjacent land area has been shown significantly to effect recreation overuse and/or underuse at WRDPS.

b. Corps planning considers socioeconomic conditions in large geographic areas that influence recreation use, but does not adequately include detailed socioeconomic and land use conditions in the much smaller area -- up to 0.75 miles of the shoreline -- within which impacts are most severe.

(1) Adjacent private residential development impedes public access to the water at 17.2% of Corps WRDPs.

(2) The number of landowners applying for permits to landscape contiguous Federal property and/or to construct floating docks is increasing dramatically at 24.1% of Corps WRDPs.

(3) Approach corridors traveled by recreationists have become aesthetically less pleasing at 37.9% of Corps WRDPs.

(4) Encroachment on Federal land by adjoining landowners occurs at 55.2% of Corps WRDPs.

(5) Accelerated nutrient-rich runoff from intensive contiguous urban developments is causing water quality degradation at 24.1% of Corps WRDPs.

(6) Inadequate Corps land in key locations is a major contributor to adverse impacts such as overcrowded recreation areas, which occur at 37.9% of Corps WRDPs.

(7) There are no controls on the development process exercised by local jurisdictions at 79.3% of Corps WRDPs and only portions of an additional 13.8% of Corps WRDPs are subject to conventional urban development controls.

c. Inadequate definition and protection of the Corps boundaries is a signficant cause of encroachment at 37.9% of Corps WRDPs.

(1) There are 112 WRDPs nation-wide whose boundaries are less than 50% monumented; the boundaries of only 132 WRDPs are 100% monumented; and the boundaries at 163 WRDPs have between 51% and 99% of their boundaries marked.

(2) Encroachments upon Federal land were reported at 48.3% of the WRDPs surveyed.

(3) There are insufficient WRDP personnel to provide adequate surveillance of the boundary.

(4) The enforcement response to encroachment problems has not been prompt nor effective.

d. Corps project personnel do not now monitor the changing relationship between concessioners on Corps land, conditions on contiguous land, and other commercial activities; thus, there is no basis upon which to adjust Corps concessioner relationships in ways that will accommodate change in competitive position.

(1) Modern marina facilities on adjacent private land are preferred over proximate older concessioner-built and operated facilities.

(2) Corps facilities originally designed to serve dispersed regional populations now receive the majority of their use from seasonal or permanent residents settled in urban densities nearby.

(3) Construction and operation of complementary facilities, such as commerical campgrounds, do not influence changes in the quantity and quality of facilities constructed and operated on Federal land.

5. Real Estate Programs and Practices

a. The organization of the real estate function at the Engineer District level is very uniform, sometimes overly so.

(1) Instrument format, record keeping, and organization of branches and sections are nearly identical in all Engineer Districts visited, except those in the North Central Engineer Division.

(2) The practices followed, e.g., establishment of fees and awarding of outgrants, are designed to encourage private use of Corps resources while protecting the public interest.

(3) Planning and management provisions in Corps lease documents are perfunctory paragraphs bearing little relationship to specific development needs or necessary management practices, providing little opportunity to match lessee performance against master plan objectives, and making enforcement difficult.

b. WRDP land, including recreation facilities built with project and Code 710 funds, have been made available to State governments and their political subdivisions; in many cases, non-Federal public bodies have been encouraged to develop and manage WRDP land for recreation and fish and wildlife under the outgrant program.

(1) Nationally, 473,826 acres are leased to the states for public park purposes; 45,473 acres are leased to political subdivisions for public recreation.

(2) In some cases, entire project areas are outgranted to one or more state agencies, but there seems to be a maximum size -- the largest WRDP totally outgranted is 24,000 acres -- beyond which states will not assume management responsibility.

c. Some Engineer District Real Estate Directorate (RED) personnel interpret their custodial responsibility to encompass areas in which they lack professional expertise and operational capability.

(1) In the absence of forceful recreation-resources management leadership, RED personnel may take a policy making posture in recreation affairs.

(2) Inadequate coordination between RED personnel and WRDP staffs intensifies encroachment and trespass problems and permits poor operations and maintenance by concessioners.

(3) In only rare occasions do RED personnel remain at the WRDPs once all parcels are acquired.

d. The low level of private concession activity is reflected in relatively low total capital invested, a limited range of facilities built on Corps land, low annual rent payments, and a lack of concession specialists on RED Engineer District staffs.

(1) Only $13.1 million was invested by private concessioners at the 29 WRDPs surveyed.

(2) Facilities provided by concessioners are largely marinas and fish camps. Total rent paid by concessioners in 1973 was $179,418.

(3) No RED personnel specializing in concession management were identified in the 19 Engineer Districts visited.

e. Administration of agriculture and grazing outgrants as interim uses poses problems in achieving the full wildlife potential of WRDPs.

(1) Responsibility for agriculture and grazing use is divided among planning, recreation-resources management, and the management and disposal element of RED.

(2) There are 542,700 acres outgranted for agriculture and 603,550 acres outgranted for grazing use nation-wide.

(3) Conflicts with wildlife occur when the cropping pattern is not coordinated with wildlife interests and when grazing animals compete directly with big game animals for available forage.

(4) Such interim uses have become institutionalized by continued reissuance of leases and by the nature of the formula distributing Corps lease income to local governments.

f. The Corps is assuming an increasing role, and local governments a decreasing role, in operating recreation areas at WRDPs.

(1) Reversion of outgranted recreation areas, even when developed at Federal expense, is increasing,

particularly when rural governments are involved.

(2) In some instances, local governments refuse to accept responsibility for operating and maintaining such developed areas in the first place.

(3) This trend will probably continue, particularly with retroactive application of cost sharing.

6. Corps Organization

a. OCE has emphasized the significance of existing WRDP resources in providing low cost outdoor recreation opportunities and contributing to balanced state and regional land use programs.

(1) Full responsibility for outdoor recreation planning was assigned to the planning division and a recreation-resources management branch was formed in OCE in 1967 and 1971, respectively.

(2) Engineer Regulations have been issued that accord full "project purpose" status to recreation and fish and wildlife enhancement at all WRDPs.

b. The decentralized Corps organization and horizontal staff structure at the Engineer District level provide great flexibility to meet a wide variety of conditions and work loads, but fail to provide a balanced overview of resource problems.

(1) Task sharing across divisions permits maximum use of professional personnel, but tends to create an attitude that recreation-resources management is a peripheral activity.

(2) Divided responsibility creates competition for manpower and management funds, results in the lack of a

common data base, and makes it difficult to fix responsibility for success and failure.

(3) Project operation personnel (dam tenders) can also perform recreation-resources management functions at the WRDPs.

c. Many of the deficiencies in recreation, fish and wildlife, Corps and contiguous land use, and real estate programs and practices are directly attributable to insufficient numbers of the right kinds of personnel in the right places.

(1) In the sample, 31 Corps professional personnel were distributed among 17 WRDPs with 867,819 acres of manageable land, 8,065 miles of shoreline, and 17.4 million visitors days of use on 31,275 acres of Corps managed recreation area.

(2) Of 95 professional person-years/year of recreation-resources management branch capability in 19 Engineer Districts visited, civil engineers comprised 25 person years/year and headed seven of the branches.

(3) The largest number of persons with natural resource related training are in Engineer District level engineering/planning divisions, not in recreation-resources management.

(4) Because supervisory positions at the Engineer District level are designed for and occupied by engineers, professional resource personnel have few career advancement opportunities and exhibit a high turnover rate.

(5) Corps WRDP personnel based at the dam site cannot effectively inspect Corps land, perform visitor

contact work, and be aware of resource conditions throughout the WRDP.

d. Decentralization over a long period of time has encouraged the development of Engineer Districts with markedly distinctive characteristics. State agencies that deal with two or more Engineer Districts report their relations are akin to working with separate agencies rather than field offices of the same agency.

7. Six Federal Agencies and Six State Agencies

a. Federal Agencies

(1) The six Federal agencies studied were created for specific and limited purposes. Recreation was initially a by-product of their original purposes, including the National Park Service which was originally established "to promote and regulate the use of national parks, monuments, and reservations, for the purpose of conserving the scenery, the natural and historic objects and the wildlife..."

(2) Actual unit cost data were not generally available for the operating land management agencies. The Department of the Interior recreation and fish and wildlife bureaus and services use incremental budgeting for program enhancement and have not developed unit costing. It is possible to take the number of visitors, or visitor days, and the total cost of operation of a given recreation area and compute a cost per recreation day. This cost can then be used to project future costs based on projected utilization factors, but most agencies were concerned about the reliability of such a technique. This technique assumes all variables, other than dollars and recreation days, remain constant.

(3) The 1973 Nationwide Outdoor Recreation Plan sets forth outdoor recreation facility cost estimates for selected activities. Operating costs based on an optimum

staffing allocation are also estimated per unit of recreation. No record was found of direct application of the data to the incremental units of increased costs for recreation activities in any land management bureaus and services.

USFS does not have unit cost data at the central office in Washington. Forest Supervisors have developed empirical data on the costs of various activities and these data generally form a basis for evaluating cost estimates from each national forest. It is recognized that costs vary from forest to forest, and there are no figures that are applicable nation wide.

(4) A continuing review of land use for recreation (more so than fish and wildlife enhancement) is being conducted by the National Conference on State Parks of the National Recreation and Parks Association. The Council on Environmental Quality has sponsored a related study on recreational use of water supply reservoirs; and the American Society of Planning Officials has sponsored an effort by Professor Richard Ragatz, to evaluate recreation homes.

b. State Agencies

(1) The six state agencies studied range from those which administer only recreation (Pennsylvania Bureau of State Parks) or fish and wildlife (Tennessee Wildlife Resources Agency) to those which administer multiple purpose activities including parks and fish and wildlife (Minnesota Department of Natural Resources).

(2) Certain specific findings may be of use to the Corps in refining its own techniques of resource allocation and the enhancement of recreation and fish and wildlife opportunities:

(a) The Texas Parks and Wildlife Commission has begun zero-base budgeting for all activities beginning with the FY 1976-78 biennium. Contrasted to incremental

budgeting, this technique requires each activity to be justified anew in each budget cycle rather than merely justifying increases beyond the prior budget. For Texas, this appears to have resulted in identifying varying levels of expenditure and the service or product results of each.

(b) The Pennsylvania Bureau of State Parks is developing, and has under pilot operation at the Pennsulvania State University, a program for allocating operational costs to 17 recreational activities. The experimental uses of this technique have been to critique operations at the park level, to assist in annual budget preparation, and to assist in long range planning.

(c) The Washington State Parks and Recreation Commission has issued rules and regulations defining the "possessory interest" of concessioners in certain facilities on state lands. "Possessory interest" is defined as "... all incidents of ownership except the right to free transfer of mortgage and legal title,..." The possessory interest is subject to provisions of the contract, state laws, and regulations relating to the area. The possessory interest may be used as security for a loan or it may be assigned, transferred, or relinquished prior to the expiration or termination of a contract with the prior approval of the Commission. The regulations provide further that the possessory interest shall not be extinguished by the expiration or other termination of the concession contract and may not be taken for public use or transferred to a successor without just compensation. This concept has not been in effect for a sufficiently long period to establish its value in encouraging recreational investments or relieving the state of recreational investment responsibilities. It appears to offer an opportunity for the use of private capital to serve a public purpose. A similar concept to provide concessioner security was incorporated in the statutory authority for the NPS in 1965.

8. There are marked regional differences in the amount of land needed to meet intensive and extensive recreational use. The Corps WRDP system constitutes a significant supply of land and water in those regions where rapid rates of increased demand are expected and where there are few alternative Federal sources of supply.

B. Conclusions

1. The overall response of the Corps to the challenge of recreation management is good for an agency that traditionally has not emphasized management of recreation resources; the overall Corps response to fish and wildlife enhancement opportunities is mediocre to very poor. This overall conclusion recognizes the extraordinarily uneven performance of the Corps organization at the Engineer District and WRDP levels.

2. Full realization of the recreation and fish and wildlife potentials of the Corps WRDP system is dependent upon national recognition and Congressional confirmation of their importance and sufficient funding and land to meet national needs.

a. No concise Congressional mandate for the management of these various resources exists.

b. The Nation will need additional public lands to meet the rapidly increasing participation in natural environment activities not normally provided by the private sector, particularly in regions exhibiting most rapid population growth. Corps WRDPs constitute a major portion of the inventory of needed land in these regions.

c. Many WRDPs possess insufficient land area to accommodate recreational demands without resource degradation or conflict with contiguous land use.

d. National recognition and Congressional direction to manage the Corps WRDP system will require financial support for personnel and other management techniques but only modest increases for capital improvements.

3. Engineer Districts and WRDP staffs do not provide a focal point for recreation and fish and wildlife considerations, nor do they contain a sufficient number of professional natural resource management specialists.

a. The largest number of professional natural resource management specialists at the Engineer District level is not in the recreation-resources management branch.

b. The management responsibility is diffused through the engineering/planning, operations, and real estate functions.

c. Professional natural resource management specialists are very limited at the WRDP level. This is true of operating personnel, such as rangers, and staff personnel, such as foresters and wildlife biologists.

d. The diffusion of various phases of recreation-resources management at the Engineer District level causes confusion and conflicts for WRDP staffs.

4. The planning process inadequately considers natural resource limitations and opportunities and linkages with management decisions, the private sector, and other public agencies.

a. WRDP personnel are not sufficiently involved in decisions concerning staffing requirements and the location, design, and use of facilities.

b. Master plans do not adequately consider: specific goals and objectives for recreation-resources management unique to each WRDP, optimum water elevations for all project purposes, specific roles for concessioners and other non-Federal entities, and the importance of integrating agricultural and grazing use of WRDP land with wildlife management.

c. Natural resource characteristics, such as soils, tolerance of vegetation, and configuration of the water body, are not adequately considered in designing specific facilities for specific sites.

4. Contiguous land uses contribute to problems of access, deteriorating aesthetics along approaches to project lands, increases in percolation of effluents and movement of storm waters into WRDP waters, and establishment of competing activities immediately adjacent to developed Corps recreation areas.

a. Only rarely has sufficient land been acquired to protect the integrity of Federal land, water, and facilities from the direct influence of contiguous land uses.

b. The Corps has no effective means to alleviate many of the problems associated with contiguous land use.

5. RED programs and practices have a profound, and sometimes adverse, impact upon recreation-resources management.

a. Restrictive lease conditions discourage private individuals from making large capital investments, produce low rent income, and produce a limited range of recreation opportunities.

b. Lease generated revenue is a function of capital investment; thus, Corps disbursements to local jurisdictions will favor those jurisdictions that contain WRDPs where the Corps has successfully attracted development.

c. Agricultural and grazing outgrants frequently impinge upon wildlife habitat and the application of sound conservation practices.

d. An alarming number of government units are abdicating responsibility for operating and maintaining Corps developed facilities, and the Corps has no explicit authority to operate and maintain such facilities at WRDPs completed prior to 1965.

6. Neither the authority for their creation, their administrative procedures and practices, nor their budgetary resources would indicate that the six Federal land management agencies studied have a mission which is broad enough to encompass the wide-ranging water resource related recreation and fish and wildlife enhancement activities of WRDPs presently under the stewardship of the Corps.

7. The rate of state level increase in these activities has not kept pace with the overall rate of economic growth within the states. In some instances, this has been attributed to the failure of sources of dedicated revenue to match needed expenditures. Missouri, Tennessee and Texas are states with a high level of dedicated revenue. Washington State recently abandoned dedicated revenues as the primary means of financing their activities. In other instances, the slower

rate of growth for recreation and fish and wildlife enhancement purposes is simply attributed to the general extension of state involvement in other social programs and a re-establishment of priorities with a fixed level of limited resources. The validity of this finding is difficult to verify at the individual agency level because of differing economic bases and varying rates of growth for each state. It is, however, the general concensus of responsible state officials, and is documented at the aggregate level by the Bureau of Census in Topical Studies, Volume 6, Number 4 of the 1972 Census of Governments, issued December 1974.

8. The Corps WRDP system has high potential for meeting Congressional statements of national need for maintaining environmental quality, providing balanced recreation opportunities, and maintaining wildlife species populations at a high level for the use and enjoyment of all Americans. These are objectives usually associated with public ownership of resources.

C. Management Alternatives

Four approaches to the management of WRDP lands were evaluated: lease or sale to the private sector; transfer to other Federal agencies; transfer to state or local governments; and retention under Corps management.

Each alternative was analyzed in terms of: (1) effectiveness in meeting the recreation-resources management responsibility associated with Corps WRDPs, (2) effect upon local tax structures, (3) effect upon national needs, (4) effect on programs of the Corps and other agencies, and (5) statutory, fiscal, and policy constraints.

The analyses assume that national needs and policy require that the Corps continue to operate WRDP physical

works for flood control, navigation, hydroelectric power, low-flow augmentation, and other purposes authorized by the Congress. Thus, lands required for these purposes could not be transferred from the Corps.

1. Lease or sale to the private sector.

a. The private sector can: provide high density, capital intensive recreation facilities, develop residences and commercial establishments, and conduct farming or forestry operations. Market perceptions and flow of income would determine which portions of WRDPs would be purchased or leased if offered.

High density facility complexes made up of marinas, lodges, deluxe campgrounds for recreation vehicles, condominiums, golf courses, and other amenities would occupy the best recreation sites and would accommodate part of the national need for such amenities. Opportunities for extensive recreation experiences, wildlife management, and public hunting would be reduced. Access to the water for fishermen, swimmers, and boaters would become difficult and, if carried to extremes, the general public could find itself excluded because of substantial admittance or user fees. Integrated shoreline and contiguous land use would depend almost entirely upon local zoning and building codes which are now nonexistent or inadequate.

Sale or lease of agricultural and forest lands could contribute to meeting national needs in those areas, but would also fail to meet the need for aesthetically pleasing public land with opportunities for recreation, fishing, or hunting.

Leasing selected lands to private interests to achieve specified goals and objectives, such as the

provision of a full range of outdoor recreation opportunities, can be accomplished by modifying existing Corps concession authorities.

b. Any sale of land would augment ad valorem tax income. The net effect upon local tax bases will vary from jurisdiction to jurisdiction, dependent upon requirements for local services.

c. Meeting national needs for intensive recreation would be enhanced by the sale or lease of land to private interests. National needs for extensive recreation would be adversely affected. The national need for retention of aesthetically pleasing land with recreation and fish and wildlife value in public hands would be adversely affected, particularly in those parts of the country where Corps WRDPs can constitute a major portion of the public lands available for hunting, fishing, and other recreation.

d. Sale of land would have considerable adverse affect upon other Corps programs. Coordination between Corps interests and those of contiguous landowners would require augmented Corps staffs to protect the quality of WRDP borders and supervise conservation of the shoreline. Sale to encourage private use also would have a deleterious impact upon state park agencies with heavy capital investment in resort state parks, putting major competitors with new facilities in close proximity to older state-built lodges and marinas. The most serious effect would be upon state wildlife agency programs to provide public hunting opportunities. Lands leased or sold to private individuals would be largely unavailable for general public entry.

Sale of property on eroding shorelines would result in requests for public assistance for shoreline protection.

e. There are significant statutory and policy constraints that would actively inhibit the sale of Corps land to private individuals. The most significant are the processes described for state and other Federal agency review of real property declared excess. If all present properties outgranted to other public agencies were claimed by those agencies and no additional property declared excess is claimed by them, only 464,495 acres of the 2,763,451 acres in the 29 WRDPs studied would become surplus. In addition, much of the WRDP land is encumbered by existing outgrants.

2. Transfer to other Federal agencies.

a. Transfer of all Corps recreation-resources management to NPS would add 407 units to the National Recreation Area system. Such a dramatic increase in acreage and recreational visitation would require significant expansion of the NPS organization. Transfer to the USF&WS or the BLM would impose very large recreation burdens upon agencies that have little experience with large-scale visitation. The USFS has demonstrated that it can plan, develop, and operate public recreation facilities, manage forest resources, and cooperate in fish and wildlife management. The USFS is experienced in administering outgrants and its operations are well systemized. USFS experience is enhanced by WRDP management responsibility shared with the Corps according to a Memorandum of Understanding first executed in 1964. In any case, dividing project responsibilities between two or more Federal agencies would lead to problems of coordination and probably duplication of effort. Additionally, personnel requirements imposed on any of the candidate recipient agencies

would sorely tax agency budgets and jeopardize existing programs.

b. Local tax structures would be effected by the formula used to compute payments made in lieu of taxes. NPS has no in lieu of tax provisions; the USFS provides for payment of up to 25% of gross National Forest receipts.

c. NPS administration would meet national recreation needs more effectively than Corps administration, but hunting and fishing opportunities might be reduced. Transfer to USFS could mean decreasing emphasis upon intensive recreation development, would not effect extensive recreation needs, and could enhance hunting and fishing opportunities.

d. The impact upon the Corps would be substantial. The cadre of resource professionals who currently share tasks would have recreation-resources management work eliminated; similarly, professional personnel performing dual functions at the project level would be reduced; and all personnel devoting full time to recreation-resources activities, including rangers, would be released or transferred to the recipient agency.

The impact upon the recipient agency likewise would be profound. The NPS would have to become much more of a multiple use agency. The USFS would have the geographic distribution of its workload shifted from the western regions to the south central and southeastern regions. Both the NPS and USFS would require administrative reorganization.

State fish and game programs currently administered on outgranted Corps lands could also be adversely affected by transfer to another Federal agency.

e. With minor legal adjustments, the USFS could accept the management responsibility for Corps recreation resources. The Congress would have to make individual determinations of national recreation significance at each WRDP prior to NPS administration. The USF&WS would require a redefined agency mission, and the BLM would need an even more extensive legislative reorganization than was considered by the 93rd Congress. USDI and USDA personnel and state personnel feel that the agencies of those departments would not be successful in securing funds to meet the management objectives cited above.

3. Transfer to state and local governments

a. The Corps has sought to outgrant as much land to state and local agencies as possible, and at some WRDPs has outgranted all project land to such agencies. The land now outgranted probably represents all the states would actively seek for recreation resource management. The upper limit is probably related to the cost of operation and maintenance. States have demonstrated little interest in large or interstate WRDPs and currently manage only portions of the land available to them by outgrant.

Neither state nor local governments possess the resources required to effectively meet the full range of recreation resources responsibilities associated with all Corps WRDPs.

b. Income now available for distribution by the Corps to local government would be lost. Some states may attempt to offset this loss by in lieu of tax payments, but costs would probably be prohibitive for all but a few states.

c. The transfer of WRDP recreation resource lands to the states would continue stewardship in public hands, and the national needs for hunting and fishing could be met at least as well as they are now if sufficient funds were available. Increasingly, national needs for hunting and fishing opportunities indicate that substantial investments in these areas would be required. Recreation development would be based upon state needs rather than any presumption of national needs.

d. This alternative would have essentially the same affect upon Corps programs as transfer to other Federal agencies. The impact on state parks, fish and wildlife, and forestry agency programs would be enormous. In some states, Corps lands that could be transferred would triple the amount of land to be protected and managed by state agencies. Nationally, 5,000 permanent and temporary positions would be added to state payrolls. Furthermore, the transfer would skew total state programs away from other equally important missions. Local governments have simply not demonstrated their ability to undertake the management of more than limited size recreation areas. If the entire WRDPs were transferred to the states, local governments would not have the opportunity to share improvement costs with the Corps under the Code 710 program.

e. The largest portion of the funds available to state recreation resource agencies comes from dedicated income and Federal categorical grants-in-aid, neither or which has expanded as rapidly as inflation. New funding from general revenue would be required, and the probability of funds sufficient to provide an adequate level of management is not promising. In addition, most states are looking

askance at new programs that place large continuing operating and maintenance obligations upon state budgets.

4. Retention by the Corps of Engineers

a. Corps retention is the most effective way of maintaining consistency with other WRDP purposes while enhancing public recreation benefits, and protecting and improving the quality of fish and wildlife resources on WRDP lands. The Corps has developed a management system that combines the best elements of the alternatives discussed: encouraging the private sector to provide services for which there is a clear and profitable market; outgranting appropriate resources to state and local entities; and cooperating, through outgrants and otherwise, with state and other Federal agencies. The principal shortcomings of this alternative are the current absence of clear direction and administrative responsibility and the lack of sufficient adequately trained professionals.

b. The effect on local tax structures is difficult to assess precisely. Currently, local communities receive a fixed return based on distribution of a percentage of lease income. Their return from private development would be a function of sales and would fluctuate.

c. Within the framework of the liberal Corps policy of outgranting lands to states and encouraging private sector participation, this alternative offers the greatest potential for meeting the full range of national recreation resource needs.

d. The effect of the Corps management system on cooperating agencies is basically beneficial to both, with room for improvement in selected areas.

e. The statutory constraints are minimal, although a clear statement of Congressional will is lacking. Within the Corps, master planning procedures must be strengthened if the potential benefits from the Corps WRDP system are to be realized.

D. Recommendations

1. Management and administration

a. Corps WRDP land should be retained by the Corps and managed for public recreation, fish and wildlife enhancement, and other project purposes, including expansion and improvement of the outgrant program to other public resource agencies.

b. A recreation-resources management division should be created in the Civil Works Directorate and replicated at each of the three major levels of command, providing a focal point for the multi-disciplined expertise needed to manage natural resources in cooperation with other public agencies, provide recreational opportunities, and assure visitor protection.

c. Persons trained to deal with problems and opportunities of expanded concessioner activity should be added in some Engineer Districts.

d. The WRDP professional field force should be increased by approximately 1,300 professional level personnel by calendar year 1978, and should be accompanied by a proportional increase in professional positions at the Engineer District level.

e. Budget requests for the recreation-resources management function should utilize a zero-based budgeting format and contain a yearly balance sheet reporting the economic goods and services produced by increments of investment in WRDP lands and waters.

f. The master planning process should: (1) establish the objectives for the management of a WRDP in concert with continual refinement of state and regional comprehensive plans (e.g., comprehensive outdoor recreation plans, regional water quality plans mandated by Section 208, Federal Water Pollution Control Act Amendments of 1972); (2) be considered a major Federal action under NEPA so full disclosure, public participation, and intergovernmental coordination will occur; (3) allocate all WRDP lands to project operations, recreation, fish and wildlife, and forestry within five years; (4) extend to all lands and waters within a specified biophysical impact area; (5) recognize the primacy of Federal and state fish and wildlife agencies in the management of fish and wildlife species and the responsibility of the Corps to manage habitat; (6) specify specific annual work programs for all involved agencies and become part of appropriate state, regional, and local plans and programs; and (7) provide for five-year re-evaluation to include alternative water levels and timing of water levels and discharges. In this process, the extent and nature of outgrants to other public agencies and inefficient, small Corps operated facilities could be phased out in favor of larger, more efficient facilities.

g. Key parcels of land, primarily at WRDPs with relatively little manageable land, should be acquired as specified in the master plans to insulate Corps facilities and resources from adverse impacts arising from uses of contiguous land.

2. Legislation

a. Congress should formally recognize the existence of a national need for widely distributed lands and waters that are available for production of outdoor recreation, fish and wildlife for the use and enjoyment of all Americans.

Further, Congress should direct the Secretary of the Army to protect and manage the public lands and waters that constitute the Corps WRDP system, to be used and enjoyed to the maximum extent by the American public for recreational purposes in perpetuity consistent with the carrying capacity of the natural resources and the health and safety of the using public.

b. The Secretary of the Army should be authorized to construct, maintain, and operate facilities for recreation and fish and wildlife enhancement at any existing or future WRDP consistent with the national interest.

c. Authority should be granted to the Secretary of the Army to operate and maintain facilities that are built at Federal expense and abandoned by lessees.

d. The Secretary of the Army's authority should be enlarged to facilitate investment in a broad spectrum of recreation facilities normally associated with the private sector of the economy.

e. Twenty-five percent of revenues received as a result of new concession agreements should be paid to the state in which the concession is located; the remaining 75% should be used by the Secretary of the Army for recreation and fish and wildlife purposes within the Corps WRDP system.

f. The Corps should have specific, but carefully limited, authority to directly intervene in instances where actions beyond the Corps boundary directly impact upon the quality of the hydrologic system of the WRDP.

g. The authority for state agencies to recover reasonable administrative costs incurred in managing wildlife resources on lands outgranted by the Corps should be restated and clarified.

h. The Federal Water Project Recreation Act (PL 89-72) should be clarified to prohibit retroactive application of its cost-sharing provisions.

These remedial measures can significantly strengthen the Corps' ability to better utilize WRDP land for recreation and fish and wildlife enhancement purposes and thus significantly increase the contribution of these lands and waters to the national interest.

TABLE OF CONTENTS

LIST OF TABLES

INTRODUCTION

A. Background

The first Nationwide Outdoor Recreation Plan states that "The Army Corps of Engineers ... reported 323 million recreation days of use in 1972 on the lands and waters at 390 reservoirs under its management"[a]. That is a significant amount of recreational use for any agency to manage, especially an agency that is primarily known for planning, building, and operating multi-purpose projects to further the development of the Nation's water resources.

The Nationwide Plan indicates that there are "...nearly 6,000 designated access areas to accommodate the public ... nearly 2,300 of the 6,000 access areas are specifically developed for recreation. The Corps manages 1,750 of these, while about 550 are managed by state and local agencies under lease." Increasing recreation visitation to "access areas" managed by the Corps of Engineers (Corps) has raised questions about Corps involvement in the provision of recreation opportunities, the rapidly growing budget requests to provide for the safety and convenience of visitors and the protection of resources, and the use for outdoor recreation and wildlife of land acquired by the United States for purposes such as flood control and navigation. There was and continues to be sharp division of opinion about the role of an engineering agency in the recreation field let alone fish and wildlife habitat management. In an effort to set forth the facts, the 93rd Congress enacted the following language as Section 25 of the Water Resources Development Act of 1974 (PL 93-251):

---

[a]U. S. Department of the Interior, Bureau of Outdoor Recreation. 1973. Outdoor Recreation: A Legacy for America. G.P.O. Washington, D. C.

> The Secretary of the Army, acting through the Chief of Engineers, is authorized and directed to study land use practices and recreational uses at water resource development projects under his jurisdiction, and to report thereon to the Congress not later than June 30, 1975, with recommendations as to the best use of such lands for outdoor recreation, fish and wildlife enhancement, and related purposes.

The language succinctly sets forth the objective of the study reported here.

The Congressional charge was applied to water resource development projects (WRDPs) that have been completed and are now providing recreational opportunities and/or essential fish and wildlife habitats, whether specifically designed for one or both purposes or not. Mitigation of net damage to or loss of fish and wildlife habitats caused by constructing a WRDP is a complex issue. Some WRDPs were authorized and built prior to general recognition of fish and wildlife values and enactment of the Fish and Wildlife Coordination Act; since strengthening amendments to the Fish and Wildlife Coordination Act were enacted, coordinated fish and wildlife recommendations, including mitigation, prepared by the U. S. Fish and Wildlife Service (USF&WS) are forwarded by District and Division Engineers to the Chief of Engineers who may or may not consider the recommendation consistent with the primary purposes of the proposed WRDP. Even if included in the Chief of Engineers' report to Congress, the Public Works Committees may not authorize the works or the Appropriations Committees may not appropriate the money authorized for mitigating the damage perceived by fish and wildlife agencies. A full-scale investigation of the adequacy and appropriateness of the mitigation activities recommended by fish and wild-

life agencies, whether finally authorized or not, is beyond the scope of this investigation authorized by PL 93:251; nevertheless, the use of WRDP waters and lands to enhance fish and wildlife populations was studied.

The Corps sought an independent contractor to carry out a multi-task investigation of Corps stewardship of the existing lands and waters entrusted to their care and to de-develop findings and conclusions based upon the investigation. The findings and conclusions drawn by the contractor selected, Coastal Zone Resources Corporation (CZRC), along with supporting documentation, are essential bases for recommendations forwarded by the Chief of Engineers.

B. Study Approach

Within the broad purpose set by Section 25, several sub-objectives were established: describe current authority; identify constraints, conflicts, and other problems associated with current Corps management; and evaluate major alternatives that might be recommended by the Chief of Engineers.

To accomplish these objectives within a tightly constrained time schedule, the study was divided into eight major tasks.

1. Analyze Existing Law

The basic intent of this task was to assess and classify Corps policies, laws, and regulations as they relate to land use, recreation, and fish and wildlife practices. A general topic outline, arranged by type of authority, was devised to permit easy reference between the policies, laws, and regulations and their intent. The categorization included the general authorities granted by the Congress to other Federal resource management agencies.

2. Review Pertinent Literature and National Data

Resource related reports and published documents were identified and reviewed early in the study schedule to provide base information for subsequent tasks. Literature gathered from the Office, Chief of Engineers (OCE) as well as that gathered from various public and private sources were utilized. Quantitative data compiled from OCE data files provided statistical reference to WRDPs nationally and at Engineer Division, Engineer District, and WRDP levels. Such data were essential tools in establishing a national base. In addition to this early review, literature and data gathered during field work were reviewed and utilized specifically during the subsequent analytic tasks.

3. Inspect and Analyze Representative WRDPs

Information was compiled by field surveys of representative WRDPs throughout the contiguous United States and similar surveys of relevant Federal and state resource related agencies.

Twenty-nine WRDPs were chosen for detailed study based upon their relation to 12 selection factors which encompassed numerous physical, resource, and management characteristics. Quantitative and qualitative information was compiled in detailed case studies for each WRDP and provided a basis for considering the current situation, identifying problems, and suggesting alternative solutions.

Corollary to the WRDP field survey was the preparation of profiles for selected Federal and state resource related agencies. Specific information concerning authority, administration, and responsibility was collected for the U. S. Forest Service (USFS), National Park Service (NPS), USF&WS, Bureau Land Management (BLM), Tennessee Valley Authority (TVA), and Bureau of Reclamation (BuRec). Specific information within the same topics was collected for the Minnesota Department of

Natural Resources, Missouri Conservation Commission, Pennsylvania Bureau of State Parks, Tennessee Wildlife Resources Agency, Texas Parks and Wildlife Commission, and Washington State Parks and Recreation Commission. Information contained in the profiles was utilized in establishing institutional characteristics and approaches and in evaluating alternative solutions to identified problems.

4. Appraise Land Use, Recreation, and Fish and Wildlife

Central to the accomplishment of this task were the analyses generated by previous tasks. Key findings developed in the case studies provided a focal point for characterizing various WRDPs, the existing resource base, and resource management and utilization. Data gathered in the field were compared to data on a national scale and conflicts, interpretational difficulties, and data gaps were identified. Relationships among governmental agencies and their organization and their management approach to resources at WRDPs on a national, district, state, and site basis were compared to the magnitude, condition, and utilization of these resources. Analyses of existing laws, policies, and regulations provided further insight into land use, recreation, and fish and wildlife practices at the WRDPs.

5. Project National Needs

Existing national policy statements and generalized demand forecasts for varying types of water-oriented recreation activities in terms of land requirements by geographic region, served as a basis for a determination of national needs.

6. Identify Major Problem Areas

In Task 6, major problem areas that result from an inadequate resource base or inefficient management of that resource base were identified. Specific conflicts, such as that between fish and wildlife enhancement and other authorized purposes, or that between governmental investment and contiguous development pressures, were related to field experiences, compiled data, and existing literature.

7. Evaluate Consequences of Alternative Solutions

Four major possible solutions to existing management problems were evaluated: (1) sale or lease of WRDP lands to the private sector, (2) transfer of WRDP lands to the state governments and their political subdivisions, (3) transfer of WRDP lands to other Federal agencies, and (4) continue administration of the lands and water by the Corps. Each alternative was analyzed in terms of: (1) effectiveness in meeting the recreation-resources management responsibility associated with Corps WRDPs, (2) effect upon local tax structures, (3) effect upon national needs, (4) effect on programs of the Corps and other agencies, and (5) statutory, fiscal, and policy constraints.

8. Recommend A Course Of Action

Based on all the preceding tasks, a recommended course of action was prepared for consideration by OCE.

C. Organization of the Report

The results of the intensive data gathering and analytical work are presented in this report. Chapter 1 outlines the current national extent of Corps administered land and water resources and the legal framework that both authorizes and constrains the management of these resources. Chapter 2 summarizes the basic methodology by which 29 WRDPs were selected to be case studies, the manner by which the data gathered in the case studies were organized and presented, and the relationship of the sample to WRDP national totals. Chapter 3 summarizes the analysis of major problem areas in Corps management of recreation and contiguous lands, real estate programs and practices, and Corps organization based on the case studies. Chapter 4 sets out information obtained from study of six Federal and six state recreation, fish and wildlife, and natural resource agencies. Chapter 5 describes national needs. Chapter 6 discusses alternative management systems. Chapter 7 contains recommendations for Department of the Army Action.

The material and analyses presented in this report are based upon independently collected, fully documented information. Documentation consists of: (1) automated searches of the literature and the United States Code; (2) research reports, survey documents, Corps master plans, and operating reports prepared by universities, state fish and wildlife agencies, regional and state planning agencies, state park agencies, and others for each of the 29 intensively studied WRDPs; (3) the state constitutions and relevant statutes controlling each of six state recreation-resource management agencies; and (4) interviews with nearly 1,000 persons including Federal and state employees, businessmen, and private citizens. The documentation has been compiled in four fully referenced technical appendices: Appendix B contains the methodology used to collect, cite, categorize, and analyze the statutory and regulatory materials; Appendix C reports the data collected for six Federal and six state recreation-resource agencies; Appendix D contains the 29 detailed case studies from which the specifics of current WRDP conditions at Corps installations nation-wide are drawn; and Appendix E is a selected bibliography.

CHAPTER 1
PRESENT SITUATION

A. Legal Framework

1. Introduction

A review of the existing statutes and regulations which control the management of resources at water resource development projects (WRDPs) under the control of the Corps of Engineers, U. S. Department of the Army (Corps), was integrated with the on-site study of 29 WRDPs selected for detailed study. This legal review was accomplished in four stages.

Initially, the statutory and regulatory authorities were assembled. The collection was effected by surveying the United States Code both section-by-section and by key words, the latter being performed with the aid of "JURIST", a computer system made available by the U. S. Department of Justice, and through review of various compendia. The titles of relevant OCE regulations were selected from U. S. Department of the Army, Office, Chief of Engineers, Military Publications, Index of OCE Directives and Publications Media (EP 310-1-1, 1974).

The authority and responsibility to manage the resources of a particular project are derived from Congressional directives which are either specific or general. For example, the authorizing legislation for a given WRDP directs the Corps to operate and maintain that specific facility. Such legislation, often a part of an omnibus Flood Control or Rivers and Harbors Act, designates the particular purposes and unique aspects of a given WRDP, either directly or by reference to the appropriate House Document describing the

plans and specifications for the dam, reservoir or other proposed works.

The second and more diverse category of relevant laws consists of those statutes which deal in more general terms with resource management. A portion of these laws apply to the Corps exclusively, others apply to all Federal resource management agencies, and other apply to other specific agencies exclusively.

All statutes and regulations material to the study were reviewed and summarized. The summaries were further reviewed and classified according to a general topic outline which recognized five major areas of authority and responsibility: public recreation; fish and wildlife enhancement; private or commercial activities on Federally owned property; resource conservation; and environmental quality.

Thereafter, as an aid to analysis, the summaries were organized into two working documents. The first was a compilation of summaries arranged by United States Code reference for statutes and by Engineering Regulation (ER) number for Corps regulations. The second organized each summary according to its classification within the general topic outline.

As a further aid, the summaries, organized pursuant to the outline, were elaborated upon. The elaborations, including practical applications from the field experience, and the full text of the statutes and ERs were relied upon in making the various legal analyses required for the study.

The review indicated that generally the Corps now has broad authority to manage multi-purpose WRDPs. Outlined below are the major authorities relevant to each area encompassed by the general topic outline enumerated above. The

outline is a general introduction to the legal framework within which the Corps manages WRDPs. The body of law from which the outline is derived is both vast and intricate and is not readily susceptible to a high degree of simplification.

2. Recreation

The Chief of Engineers is authorized to construct, maintain, and operate public park and recreational facilities at WRDPs under the control of the Department of the Army (Flood Control Act of 1944, §4, as amended, 16 USC §460d). The Army is further required to give full consideration to the opportunities a given project affords for outdoor recreation (Federal Water Project Recreation Act, §1, 16 USC §460ℓ-12). Additionally, whenever a project can serve both the water resource purpose for which it was proposed and the enhancement of recreational opportunities, the recreational potential will also be developed in accordance with the various statutory constraints (§16 USC §460ℓ-12). Consonant with the law, adequate interests in land are acquired for the realization of optimum present and future outdoor recreational potential (Planning and Project Authorization - Civil Works Projects, ER 405-2-150; see also 16 USC §460ℓ-14(b)).

In general, the public must be given open access to and from the water areas of any WRDP for the purposes of boating, swimming, fishing and other recreational activities (16 USC §460d). Unless an area is designated to be included within a national recreation area, a national forest, or some other Federally sponsored program, or a non-Federal public body agrees to administer a completed facility and to assume the costs of one half the construction and all the operation and maintenance, the Corps since 1965 may develop only minimal

recreational facilities which are required for public health and safety (Federal Water Project Recreation Act, §§1-3, 16 USC §460*l*-12-14). All planning for the development of recreational facilities at a given project is to be coordinated with existing and planned Federal, state, or local facilities and to the extent feasible should be consistent with the statewide comprehensive outdoor recreation plan sponsored by the U. S. Bureau of Outdoor Recreation (BOR) (Federal Water Project Recreation Act, §§1, 6(a), 16 USC §§460*l*-12 and 17).

Non-Federal public bodies can receive financial support from the Land and Water Conservation Fund to help defray the costs of project planning, land acquisition, and the development of Federal lands which are under lease to states (Land and Water Conservation Fund Act, §6, as amended, 16 USC §460*l*-8(e)). Although the fund is also available for numerous Federal recreational programs, the Corps does not participate (Land and Water Conservation Fund Act, §7, as amended, 16 USC §460*l*-9(a)).

No admission fees of any kind may be charged for entrance into any Corps recreation areas. Daily use fees may be charged at certain recreational facilities: such fees, however, may be charged only for a specialized outdoor facility which has been provided at Federal expense. In no event may the Corps assess a fee for the following: drinking water, wayside exhibits, roads, overlook sites, visitors' centers, scenic drives, toilet facilities, picnic tables, and in most instances, boat launches. Additionally, whenever camping is permitted at a project, the Corps must provide at least one

primitive campground, without charge, at which designated campsites, sanitary facilities, and vehicular access are available (Land and Water Conservation Fund Act, §4, as amended, 16 USC §460*l*-6).

The Secretary of the Army may grant leases of land including the structures or facilities thereon for such periods, upon such terms, and for such purposes as he may deem reasonable in the public interest. Whenever outgrants are made, preference is given to Federal, state and local governmental agencies. A lease or license to such agency or a non-profit organization may be granted without monetary consideration (16 USC §460d). Recreational leases are granted for various purposes including [in order of priority established in Leases (ER 405-1-830)]:

(a) state facilities
(b) commercial concessions
(c) the recreational activities of non-profit organizations
(d) private recreational uses.

In addition, lands which have been retained for other project purposes or for future recreational development may be leased for agriculture or grazing (Management and Utilization of Civil Works Lands, ER 405-2-835).

The Corps is required to inventory its property from time to time to determine what properties are excess and to dispose of those properties in accordance with regulations promulgated by the General Services Administration (GSA)

(Federal Property and Administrative Services Act of 1949, 40 USC §§471-475). Annual reports are filed which describe properties deemed to be underutilized in the sense that their present use is irregular or intermittent; properties superfluous to a program; properties suitable for better purposes; or properties the operation and maintenance costs of which are too high relative to similarly utilized properties. Those areas judged to be underutilized are disposed of as excess or surplus property, either by the GSA or the Secretary of the Army (Government Management: Property Management, 34 CFR §231). The Secretary of the Army is specifically authorized to offer cottage sites for sale if he determines the lands are not otherwise needed for public recreation, or other project purposes (Act of August 6, 1956, 16 USC §460e), but as noted, this use of public land is afforded very low priority.

Activities at any Corps WRDP are governed by rules and regulations promulgated by the Secretary of the Army. In no case may a use be permitted which would be inconsistent with the laws for the protection of fish and game of the state in which the project is situated (16 USC §460d).

3. Fish and Wildlife Enhancement

When not inconsistent with the primary purposes of a project, the Corps is required to make adequate provision for the conservation, maintenance, and management of wildlife resources (Fish and Wildlife Coordination Act, §3, as amended, 16 USC §663(d); Flood Control Act of 1938, §1, 33 USC §540). The term "wildlife resources" is defined to include birds, fish, mammals and all other classes of wild animals and all types of aquatic and land vegetation upon which wildlife is

dependent (Fish and Wildlife Coordination Act, §8, as added, 16 USC §666b). All planning for the development or modification of a project is coordinated with the USF&WS (Fish and Wildlife Coordination Act, §2, as amended, 16 USC §622(a)). The Corps may acquire lands, waters, and interests therein, for wildlife conservation in connection with a particular project subject to the same Congressional authorization requirements as other project purposes (16 USC §663(c)). Such areas are to be utilized in accordance with a general plan approved jointly by the Secretary of the Army, the Secretary of the Interior, and the head of the state agency exercising administration over wildlife resources in the state in which the project is situated. The various areas may be made available to appropriate state agencies for administration (16 USC §460d; 633(b)).

Areas with fish and wildlife enhancement potential will normally enjoy a minimal degree of development, absent an agreement by a non-Federal policy body to maintain and operate a given area. However, lands which potentially could be developed by state agencies are held in anticipation of such an agreement for at least ten years after the initial operation of the project (Federal Water Project Recreation Act, §3, as amended, 16 USC §460ℓ-14(b)). The lessee or licensee, of a fish and wildlife area may be authorized by the Secretary of the Army to cut timber and harvest crops as is necessary for the beneficial use of the area, and may collect and utilize the proceeds of any resulting sales for the development, conservation, maintenance, and utilization of the land (16 USC §460d).

In addition to the authorities cited above, a multitude of Federal and state statutes bear upon the management of

wildlife resources at Corps WRDPs. Of particular import are: The Endangered Species Act; the National Wildlife Refuge System Act; and the Migratory Bird Conservation Act.

4. Private or Commercial Activities on Federally-Owned Property

Approved private and commercial activities on Corps properties involve a diverse grouping of rights and interests, e.g., an easement for powerline or pipeline, a concession, or an adjacent landowner's permit to use WRDP land. The Secretary of the Army is authorized to grant leases of land, including structures or facilities thereon, for such periods, upon such terms, and for such purposes as he may deem reasonable in the public interest (16 USC §460d). The Chief of Engineers may amend any lease for a commercial recreational facility to provide for a change in the amount of rental or other consideration payable to the United States (PL 87-236, 16 USC §460d-1). Seventy-five percent of all lease rentals are returned to the states in which the property is situated to help defray the costs of county government (Flood Control Act of 1941, §7, as amended, 33 USC §701c-3).

The Secretary of the Army is authorized under a variety of statutes to grant easements or rights-of-way. A review of these authorities indicates the Secretary may delegate to the Chief of Engineers the authority to grant an easement for nearly any purpose, so long as the public interest is preserved. When read together these authorities give the Secretary the power to grant an easement for an unspecified length of time to a state, a political subdivision thereof, a corporation, or an individual, for all required lands for any

purpose. An easement may be terminated on account of: (1) failure to comply with the terms of the grant; (2) non-use for two years; or (3) abandonment (PL 87-852, §§1-4, 40 USC §§319-319c; Act of August 10, 1956, 10 USC §2668). In addition, specific authorities exist for the granting of easements for particular purposes, including power and pipelines, roads, streets, railroad tracks, ferry landings, bridges, and livestock crossings.

Use of land and water areas by adjoining landowners may be permitted where such use is not inconsistent with planned or present uses of the area, and where such use will not deny the general public access to the shoreline. Permits may be issued under Title 36, Code of Federal Regulations (CFR), by the District Engineer in the form of a simple authorization to perform an act which would otherwise constitute a trespass or encroachment (Management and Utilization of Civil Works Lands, ER 405-2-835).

5. Conservation

Responsibility for the conservation of the nation's natural resources rests primarily with the Departments of the Interior and Agriculture. Accordingly, the vast majority of statutory directives in this area pertain primarily and directly to these departments, and often only secondarily or indirectly to the Department of the Army.

An exception to this general rule is the requirement that lands owned in fee by the Army are to be developed and maintained to promote adequate and dependable future resources of readily available timber and to increase the value of such areas for conservation, recreation, and other beneficial uses (PL 86-717, §§1, 2, 16 USC §§580m-n). To implement this policy, the Chief of Engineers may provide for the protection

and development of forests and other vegetative cover and is required to establish and maintain other conservation measures at reservoir areas under his jurisdiction (16 USC §§580m-n).

A diverse array of statutory authorities relate to the protection of wilderness areas. With particularity, various elements of the National Park System, the National Forest System and the National Wildlife Refuge System are concerned with preserving natural settings in their wild state. The National Wilderness Preservation System, created pursuant to the Wilderness Act of 1964, is composed of Federally owned areas designated by Congress to secure for the American people "the benefits of an enduring resource of wilderness" (16 USC §1131).

Similarly, the Wild and Scenic Rivers Act created a National Wild and Scenic Rivers System which preserves in a free-flowing condition those rivers or sections thereof which are of outstandingly remarkable scenic or recreational value. Rivers may be included by act of Congress or by state action. In planning the use and development of water and related land resources, the Corps is required to consider a river's potential as a National Wild and Scenic River (16 USC §§1271-1287).

6. Environmental Quality

The Secretary may promulgate such regulations for the use of WRDPs as he deems necessary, including prohibitions against the unauthorized disposal of refuse or litter of any kind either into the water or onto any land Federally owned and administered by the Chief of Engineers. As noted previously, no project area may be used in a manner which is inconsistent with the laws for the protection of fish and game

of the state in which the project is situated (16 USC §460d). The Secretary of the Army has authority to control the introduction of obstructions into navigable waters, e.g., docks, or the dumping of dredged material therein (River and Harbor Act of 1899, §10, 33 USC §403; Federal Water Pollution Control Act Amendments of 1972, §404, 33 USC §1344).

Within the last decade, a number of environmentally-oriented Federal statutes have been enacted in an attempt to insure environmental quality by the regulation of various private and governmental activities. The mandate of each enactment extends to most Federal activities and therefore to the management of resources at Corps WRDPs.

The National Environmental Policy Act of 1969 directs all Federal agencies to adhere to certain substantive and procedural requirements in making decisions which affect the environment. Before a major Federal action is undertaken which might significantly affect the quality of the human environment, the Corps, using a multi-disciplinary approach, must first file an environmental impact statement discussing the environmental implications of the proposed action (42 USC §4332).

The Clean Air Act imposes a number of requirements upon the Corps relating to the abatement of air pollution, including compliance with Federal, state, interstate and local regulations governing the control of air pollution (42 USC §1857f).

The Federal Water Pollution Control Act Amendments of 1972 provide that all Federal agencies with jurisdiction over any property or facility, or which engage in an activity

that might result in the discharge of pollutants into navigable waters, must comply with Federal, state, interstate, and local requirements governing the control of water pollution. The Act also prohibits a Federal agency from entering into a procurement contract with any person who has been convicted of an offense under the enforcement provisions of the Act. Finally, the Act imposes a number of requirements on the issuance of permits and licenses by Federal agencies. In general, an applicant for a Federal license or permit must provide the agency involved with state certification that the activity to be conducted on Federal property will not result in a discharge into navigable waters in violation of the various provisions of the Act (33 USC §§1323, 1341(a) (1), and 1368(a)).

The Solid Waste Disposal Act of 1965 provides that if a Federal agency has jurisdiction over any real property or facility, the operation of which involves the agency in solid waste activities or leads the agency into contracts with any persons for the operation of any Federal property or facility, wherein the performance of such contract would involve such persons in solid waste disposal activities, that agency must ensure compliance with the guidelines recommended under the Act (42 USC §3254e(a)(1)). Furthermore, an executive agency must comply with the guidelines recommended under the Act if it engages in an activity which generates solid waste or which, if conducted by a person other than such agency, would require a permit or license from the agency in order to dispose of the waste (42 USC §3254e(a)(2)). Finally, the Act requires an executive agency which permits the use of Federal property for solid waste disposal purposes to adhere to guidelines under

the Act (42 USC §3254e(a)(3)).

The Noise Control Act of 1972 requires all agencies which have jurisdiction over property, or which themselves engage in activity that produces noise, to comply with Federal, state, interstate, and local requirements governing the control and abatement of noise (42 USC §4903(b)).

Moreover, Executive Order 11752 requires the Chief of Engineers, as well as the heads of all other Federal agencies, to ensure that all facilities under their jurisdiction are designed, constructed, managed, operated, and maintained in accordance with the mandates of various environmentally oriented statutes, including the laws enumerated above. (3 CFR 380).

B. Corps Recreation, Fish and Wildlife Resources

1. Genesis of Corps Civil Projects

The Corps is both a civil and military engineering and construction agency. From its inception the Corps has been concerned with civil functions. The Corps was the engineering department of the government which planned and executed the national internal improvements program initiated in the 1820's. Among the first projects undertaken were improvements of the navigation of the Ohio and Mississippi Rivers, the building of the Chesapeake and Ohio Canal, and the continuation of the Cumberland Road. In 1852 Congress placed rivers and harbors work generally under the Corps, and in 1917 provided that the laws relating to the improvement of rivers and harbors apply to works of improvement for flood control. Flood control work for the nation as a whole was more definitely assigned to the Corps by the provisions of the Flood Control Act of 1936 (33 USC §§701a-f, 701h)[a].

[a] Maass, Arthur A. 1951. Muddy Waters. Harvard University Press, Cambridge, Massachusetts.

2. Expansion of the Purposes of Water Resource Development

Corps water resource projects are presently developed to meet specific local or regional problems and include planning for the development of entire river basins. Planning for each project involves comprehensive studies to ascertain optimum development of water resources. Planning considerations include navigation, flood control, generation of hydroelectric power, water conservation, domestic and industrial water supply, pollution abatement, fish and wildlife, recreation, and other potential water resource uses. An example of a multi-purpose project is J. Percy Priest which was authorized and developed for recreation, generation of hydroelectric power, and flood control. Missouri River mainstem reservoirs are other examples of multi-purpose projects. In most Corps WRDPs, nevertheless, flood control and nagivation remain the dominant project purposes.

3. Project Characteristics that Influence Recreation, Fish and Wildlife

Recreation and fish and wildlife resources at WRDPs are influenced by a variety of characteristics. However, there are some basic characteristics, such as project purposes, physical characteristics, and project location, which influence the magnitude of development, use, and quality of recreation and fish and wildlife resources.

Physical characteristics of a WRDP are controlled by project purposes and the topography of the project area. Existing projects range from a single navigation canal with only one acre of upland to large multi-purpose reservoirs occupying over 600,000 acres. At present, Corps WRDPs reported in Recreation-Resource Management System (RRMS 1973) are comprised of 259 reservoirs, 140 locks, seven canals, and one floodway; a total of 407 WRDPs in the contiguous United States.

Reservoirs constructed in areas of low to moderate topographical relief are characterized by relatively wide pools, in relation to the length of reservoir, and have gradual slopes bordering the shoreline. Those constructed in rugged terrain are characterized by relatively narrow pools, steep slopes, and/or shoreline bluffs.

A WRDP may be one of a series of supporting projects that influence and are influenced by collateral upstream or downstream WRDPs. Such interrelated WRDPs occur along large river systems such as the Mississippi and Missouri Rivers. Some WRDPs occur as single projects along small tributaries which influence only the immediate area.

Location of WRDPS in relation to urban, suburban, and rural areas varies among and within individual projects. At Old Hickory near Nashville, Tennessee, suburban sprawl has encompassed the lower reaches of the project while the upper reaches have remained rural. Other WRDPs located near metropolitan areas, such as Colebrook River Lake near Hartford, Connecticut, have remained surrounded by rural environments.

4. Recreation Resources

Six major Federal agencies provide recreation areas, facilities, and services: BLM, NPS, USF&WS, BuRec, USFS, and the Corps. In 1972 they administered over 283 million acres, of which the Corps is responsible for about 10.6 million acres or 3.7%. In 1972, the year of record for the Nationwide Plan, Corps WRDPs recorded 323 million visits (36.5%). During this same period, the NPS reported 212 million visits (23.9%), the USFS 184 million visits (20.1%), the BLM 92 million visits (10.4%), the BuRec 56 million

visits (6.3%), and the USF&WS 19 million visits (2.1%).[a] By 1973, total visitation to all Corps WRDPs had increased by 16 million to 39 million in spite of the year-end fuel crisis (Table 1-1). These totals include all 50 states, the Commonwealth of Puerto Rico, and the trust territories.

In 1973, the Corps administered 407 WRDPs in 42 of the 48 contiguous states. Administration is delegated by the Chief of Engineers to ten Engineer Divisions and 34 Engineer Districts (Figure 1-1). There were 2,718 intensive recreational areas which occupied 943,567 acres (Table 1-2). Of these 2,718 WRDP recreation areas, the Corps administered 1,911 areas, 38 were managed by other Federal agencies, 364 were managed by state agencies, 252 were managed by local governments, and 153 were managed privately (RRMS 1973). Facilities available throughout all Corps WRDPs included 54,093 picnic sites, 51,364 campsites, 444 group areas, 2,536 boat launch ramps, 679 swimming beaches, 502 bath/change units, 751 miles of hiking trail, and 311 concessions. Visitation to these lands and facilities in the contiguous states reached 262,493,307 in 1973 (Table 1-1).

Many different organizations have taken advantage of the Corps' outgrant policies by establishing water-based recreational areas at WRDPs at costs generally dependent upon the type of organization, the nature of the proposed use, and physical site characteristics.

Governmental agencies and special districts may acquire outgrants for recreational purposes without charge. In

---

[a]These data are quoted from: U. S. Department of the Interior, Bureau of Outdoor Recreation. 1973. Outdoor Recreation: A Legacy for America. The document does not distinguish among the several methods used by Federal agencies to report recrea-

Table 1-1 Water Resource Development Project Attendance by Engineer Division, 1973[a].

Division	Project Attendance	No. Districts
Lower Mississippi River	31,563,800	4
Missouri River	23,724,500	2
New England	4,546,600	1
North Atlantic	2,058,300	3
North Central	29,800,500	4
North Pacific	14,400,000	3
Ohio River	71,971,400	4
South Atlantic	53,436,400	5
South Pacific	9,725,800	3
Southwestern	97,870,600	5
Total 10	339,097,900[b]	34

[a] RRMS 1973.

[b] 262,443,307 visits to 407 WRDPs in the contiguous 48 states.

tion visitation. Suffice it to say that the Federal agencies have not fully followed the implementation provisions of Recreation Advisory Council. 1965. Federal Executive Policy Governing the Reporting of Recreation Use of Federal Recreation Areas. G. P. O. Washington, D. C.

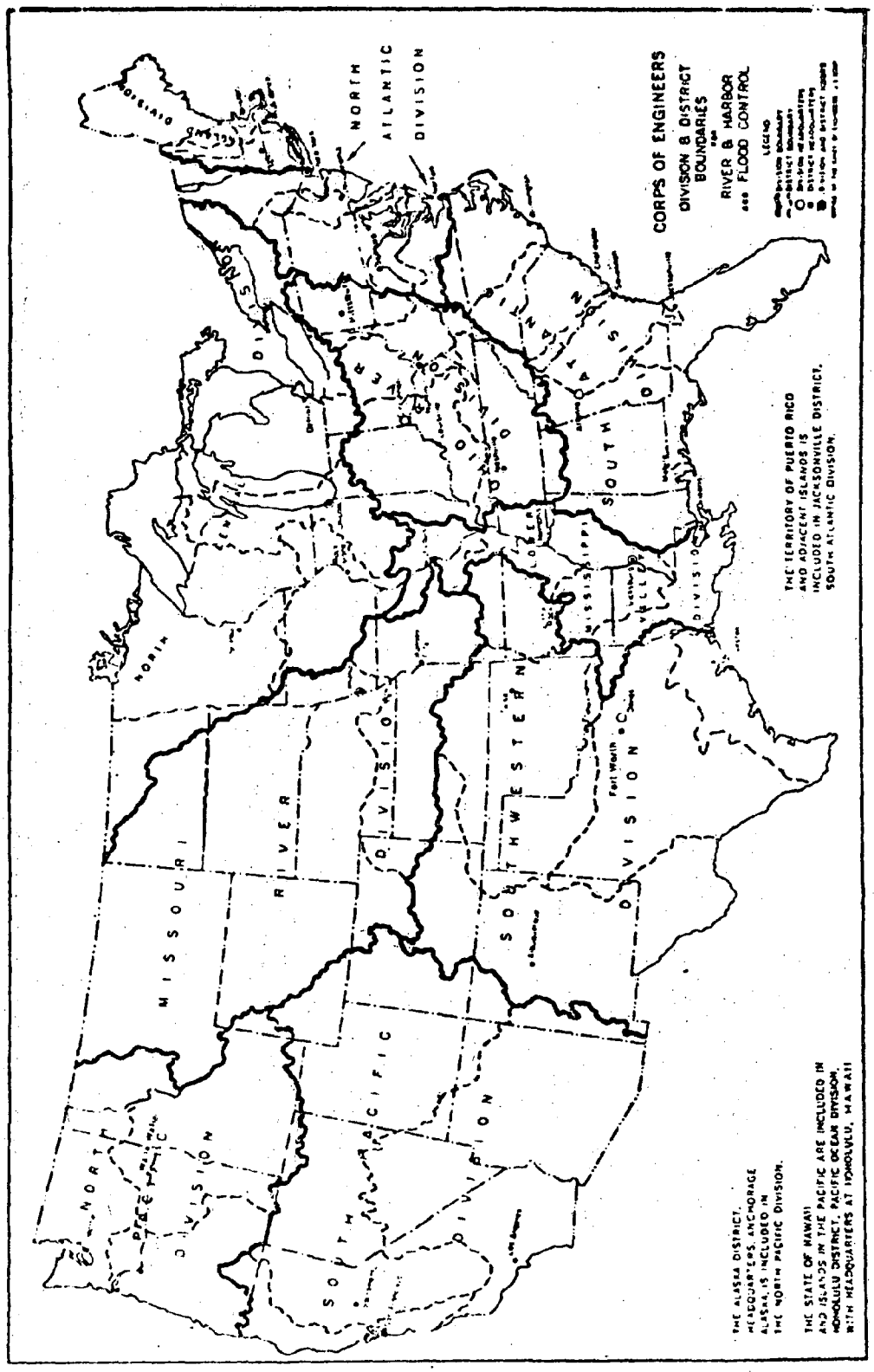

CORPS OF ENGINEERS
DIVISION & DISTRICT BOUNDARIES
FOR
RIVER & HARBOR AND FLOOD CONTROL
NORTH ATLANTIC DIVISION
NORTH CENTRAL DIVISION
SOUTH ATLANTIC DIVISION
MISSOURI RIVER DIVISION
SOUTHWESTERN DIVISION
NORTH PACIFIC DIVISION
SOUTH PACIFIC DIVISION
THE TERRITORY OF PUERTO RICO AND ADJACENT ISLANDS IS INCLUDED IN JACKSONVILLE DISTRICT, SOUTH ATLANTIC DIVISION.
THE ALASKA DISTRICT, HEADQUARTERS, ANCHORAGE ALASKA, IS INCLUDED IN THE NORTH PACIFIC DIVISION.
THE STATE OF HAWAII AND ISLANDS IN THE PACIFIC ARE INCLUDED IN HONOLULU DISTRICT, PACIFIC OCEAN DIVISION, WITH HEADQUARTERS AT HONOLULU, HAWAII

FIGURE 1-1

Table 1-2 Recreation Areas, Acreage, and Visits by State at Corps Water Resource Development Projects, 1972.

State	No. of Recreation Areas	Acreage		Visitation	
		Corps	Non-Corps	Corps Recreation Areas	Non-Corps Recreation Areas
Alabama	110	12,862	416	3,888,681	222,766
Arizona	2	0	8,892	0	57,800
Arkansas	155	23,038	2,262	18,716,960	1,955,966
California	47	1,424	9,377	2,485,400	8,480,200
Colorado	4	1,900	2,150	121,200	253,700
Connecticut	11	2,520	4,355	751,262	265,800
Delaware	1	7,775	0	153,500	0
Florida	15	7,099	0	757,199	0
Georgia	227	15,609	11,262	8,499,579	5,235,699
Idaho	9	3,866	1,112	304,000	1,107,800
Illinois	90	38,075	38,854	5,711,088	2,322,231
Indiana	57	37,873	19,308	656,560	3,627,337
Iowa	59	5,025	25,132	3,894,500	1,214,924
Kansas	93	13,896	7,956	6,181,700	3,111,600
Kentucky	156	76,053	17,337	7,534,377	5,138,428
Louisiana	8	40	1,700	201,300	157,400
Massachusetts	29	5,119	9,099	1,718,900	771,100
Maryland	1	45	0	33,200	0
Michigan	2	8	0	967,806	0
Minnesota	19	857	113	1,258,460	48,800
Mississippi	67	4,769	10,321	5,938,491	1,047,877
Missouri	93	12,116	6,021	7,747,697	1,743,518
Montana	13	3,731	2,075	565,100	90,500
N. Carolina	24	1,611	2,664	1,035,895	989,900
N. Dakota	49	3,903	4,891	1,050,240	712,880

Table 1-2 (Continued)

State	No. of Recreation Areas	Acreage		Visitation	
		Corps	Non-Corps	Corps Recreation Areas	Non-Corps Recreation Areas
Nebraska	23	1,688	1,251	928,440	560,600
New Mexico	9	208	742	133,500	289,500
New Hampshire	15	3,351	7,853	342,300	183,500
New York	6	25	4,419	600	618,931
Ohio	93	15,396	41,129	4,439,609	15,312,620
Oklahoma	202	36,273	31,426	18,946,900	8,121,700
Oregon	81	724	2,935	2,743,343	3,322,624
Pennsylvania	52	27,797	23,966	4,374,875	1,412,998
S. Dakota	82	17,731	5,269	3,443,800	1,290,600
S. Carolina	80	4,113	3,253	2,742,995	934,240
Tennessee	144	7,863	4,104	9,896,330	2,578,920
Texas	240	45,742	7,771	27,788,629	4,648,000
Virginia	44	3,591	2,931	2,213,350	374,100
Vermont	9	4,897	857	336,500	38,400
W. Virginia	51	8,943	4,947	3,224,862	658,080
Washington	40	84,997	4,614	2,703,974	2,039,093
Wisconsin	12	382	240	197,260	78,500
Totals (42)	2,524	542,935	333,004	164,630,362	81,018,632
	2,524	875,939		245,648,994[b]	

[a] RRMS 1972.

[b] Visitation at WRDPs in the 48 contiguous states; 77.4 million visits were reported at Corps WRDPs in the non-contiguous states, territories and the Commonwealth of Puerto Rico.

1973, the outgrants to governmental agencies totaled 512,299 acres (Table 1-3). The salutory effect of these Federally acquired lands is shown in Table 1-4.

Religious groups, youth organizations, and charitable organizations may acquire outgrants at a minimal fee which in some cases is one dollar per term of the lease or a dollar per year. Such organizations administered 25,933 acres for recreation purposes at Corps WRDPs in 1974 (Table 1-5).

Private groups, such as sailing and fishing clubs, pay an annual rent which is based on a percentage of the assessed land value. In 1974, outgrants for private recreation accounted for 4,158 acres (Table 1-5).

There were 744 outgrants for commercial recreation purposes on 14,133 acres (Table 1-5). Although concessions provide a variety of services to the visiting public, most are marina type services accommodating the boating public. Concessioners pay an annual rent based on a fixed rate or a fixed fee plus a percentage of gross receipts.

Income derived from the lease of concession sites, agriculture and grazing privileges, and other rents are deposited in a special account. Seventy five percent of these revenues are disbursed through the state governments to the county governments wherein the land leased is located. During the fiscal year that ended 30 June 1974, the Corps distributed $3,715,061 to local governments in 42 of the contiguous states (Table 1-6).

5. Fish and Wildlife Resources

Upland biotic communities associated with streams and rivers afford excellent wildlife habitat which is irretrievably lost when flooded. WRDP lands not inundated have high

Table 1-3 Summary of Acreage Outgranted to Non-Federal Agencies for Public Recreation by Engineer Division.[a]

Engineer Division	Acreage Outgranted for Public Recreation to Municipalities	Counties	Sp. Districts	States
Lower Mississippi Valley	182.5	1,684.3	595.5	25,687.9
Missouri River	1,530.7	2,818.4	445.3	28,195.0
New England	226.9	0	0	16,841.0
North Atlantic	316.3	478.0	0	9,828.6
North Central	1,180.8	3,000.8	0	13,259.5
North Pacific	614.2	3,384.6	180.0	8,879.0
Ohio River	1,894.4	1,862.0	209.8	302,713.7
South Atlantic	2,969.8	2,122.7	1,515.0	24,387.2
South Pacific	4,709.2	5,294.7	0	10,056.9
Southwestern	5,842.0	2,415.3	0	33,977.6
Totals for Nation	19,466.8	23,060.8	2,945.6	473,826.4

a. Office, Chief of Engineers, 1974. Summary of outgrants-active, as of 31 December, 1974 Washington, D.C.

Table 1-4. Contribution of Corps Land to Municipal, County and State Park and Recreation Systems

	Total Reported	Corps Outgrants	%
Municipal[a]	938,100[b]	22,412[c]	2.4
County	1,298,700[b]	23,061	1.8
State	5,483,200[d]	473,826	8.6
	15,771,500[e]	1,440,245	9.1

[a] Includes city, township, park and recreation districts and regional councils.

[b] Regional, Community and Neighborhood Parks and Recreation Areas.

[c] Includes outgrants to municipalities and special districts.

[d] Regional, Community and Neighborhood Parks and Recreation Areas, and other areas.

[e] Fish and Game Areas.

Table 1-5 Summary of Selected Corps Outgrants and Acreage.[a]

Division	Agriculture		Fish & Wildlife		Grazing		Recreation Commercial		Recreation Private		Recreation Public Park		Recreation Quasi-Public		Total	
	No.	Acres	No.	Acres	No.	Acres	No.	Acres	No.	Acres	No.	Acres	No.	Acres	No.	Acres
Lower Mississippi Valley	746	80,815.9	16	383,692.4	310	47,355.3	92	1,977.3	881	1,294.2	67	28,812.5	21	2,262.5	2,133	546,210.1
Missouri River	1,389	200,291.0	36	326,599.9	527	81,205.2	39	2,145.2	485	297.4	70	36,847.4	46	3,913.5	2,592	651,299.6
New England	34	1,384.6	9	14,676.0	25	1,581.7	0	0	2	0	15	17,067.9	1	1.8	86	34,712.0
North Atlantic	34	1,754.4	7	14,866.2	6	119.5	5	15.7	121	80.3	20	10,622.9	4	3,447.9	197	30,906.9
North Central	306	24,686.0	25	165,870.7	30	1,944.1	30	301.6	698	553.3	79	17,585.3	24	408.7	1,192	211,349.7
North Pacific	4	10.5	14	42,594.0	80	9,588.5	6	14.8	7	27.3	40	15,153.5	1	67.0	152	67,455.6
Ohio River	349	12,981.8	40	263,111.0	47	991.0	83	2,881.9	15	115.6	106	301,895.0	18	2,278.0	658	584,254.3
South Atlantic	114	4,295.8	16	54,155.5	35	1,843.6	41	1,825.4	262	1,050.8	66	31,387.8	90	5,917.1	624	100,476.0
South Pacific	56	8,182.3	1	22,855.7	40	21,202.4	11	795.0	3	33.0	20	21,821.9	1	28.3	132	74,918.6
Southwestern	1,314	208,310.6	53	553,852.9	2,568	437,718.3	437	4,156.4	218	705.9	74	40,794.0	77	7,608.2	4,741	1,253,146.3
Total	4,346	542,712.9	217	1,842,274.3	3,668	603,549.6	744	14,113.3	2,692	4,157.8	557	521,988.2	283	25,933.0	12,507	3,554,729.1

[a]Office, Chief of Engineers. 1974. Summary of outgrants-active, as of 31 March 1974. Washington, D. C.

Table 1-6 Lease Monies Returned by the Corps to Local Governments in Fiscal Year 1974.[a]

State	Amount Returned ($)[b]
Alabama	6,191
Arkansas	162,643
California	184,790
Colorado	23,372
Connecticut	9,631
Delaware	3,765
Florida	7,661
Georgia	148,615
Idaho	1,627
Illinois	104,734
Indiana	27,170
Iowa	295,745
Kansas	221,946
Kentucky	84,303
Louisiana	93,686
Maryland	386
Massachusetts	4,199
Michigan	1,565
Minnesota	21,745

Table 1-6 (Continued)

State	Amount Returned ($)[b]
Mississippi	282,912
Missouri	589,325
Montana	5,652
Nebraska	89,834
New Hampshire	2,621
New Jersey	40,438
New Mexico	1,088
New York	374
North Carolina	3,859
North Dakota	89,102
Ohio	46,486
Oklahoma	529,877
Oregon	7,836
Pennsylvania	98,059
South Carolina	11,498
South Dakota	48,080
Tennessee	80,153
Texas	347,715
Vermont	135
Virginia	14,237

Table 1-6 (Continued)

State	Amount Returned ($)[b]
Washington	10,807
West Virginia	3,427
Wisconsin	7,772
Total 42	3,715,061

[a]Personal communication, 22 November 1974, Office, Chief of Engineers, Recreation Resource Management Branch, Washington, D. C.

[b]Equals 75% of amount collected.

potential for substituting other species for wildlife lost. At many Corps WRDPs, lands suitable for wildlife management are outgranted for grazing and agricultural purposes; in 1974, 1,146,262.5 acres were outgranted for these purposes versus 1,842,274 acres outgranted to state and Federal agencies for fish and wildlife purposes (Table 1-7).

WRDP fishery resources may receive intensive management designed to mitigate fishery losses, particularly when cold water streams are impounded, and to enhance productivity by habitat manipulation and stocking. Multi-level fisheries have been created at many Corps WRDPs providing fishermen with both cold and warm-water game fish. Additionally, cold-water fish (usually trout) have been stocked in tail-races by state agencies on a put and take basis to replace endemic warm water fisheries eliminated by cold reservoir discharges.

6. Attractiveness

In his work in landscape evaluation, Phillip H. Lewis, Jr. devised an analytic system based upon open water, wet-land, steep topography, and mature vegetation. By combining these factors, Lewis identified corridors of environmental quality. During a Wisconsin test, valuable resources specifically inventoried by many disciplines, such as foresters, wildlife biologists, and historians, were plotted. More than 86% of the important resources were located within the corridors defined by landscape evaluation. Later work by Lewis in the North Central Engineer Division and elsewhere showed that on a scale of 1:250,000 the corridors followed the steep edges of natural water courses.

Corps WRDPs have, of course, been largely built within these zones of high environmental quality. The combinations

Table 1-7. Corps Land Licensed for Fish and Wildlife Management by Engineer Division[a].

Engineer Division	Acres Outgranted to: USF&WS	States
Lower Mississippi Valley	1,868.9	381,817.5
Missouri River	143,485.1	171,084.8
New England	0	14,676.0
North Atlantic	0	14,866.2
North Central	127,110.1	37,853.6
North Pacific	22,457.8	20,136.2
Ohio River	200.3	251,131.3
South Atlantic	15,378.0	78,399.2
South Pacific	0	22,855.7
Southwestern	67,528.0	467,424.9
Totals for Nation	378,028.2	1,440,245.4

[a]Office, Chief of Engineers, 1974. Outgrants-active, as of 31 December 1973, Washington, D. C.

of lake size and diversity, superimposed upon a high quality landscape, mean that many Corps WRDPs are aesthetically attractive.

This is borne out in the preponderance of WRDPs that report sightseeing and fishing as the number one or number two recreation activity. This is consistent with the Nationwide Plan findings that "...the simple pleasures were the most favored".[a] This must be tempered, of course, by supply. WRDPs without developed or designated camping areas do not report high camping participation. The attractiveness of these WRDPs begins to draw people from the date they begin operation. They have been created very largely at national expense and the potential recreation and fish and wildlife benefits to the nation, whether or not specifically recognized in project authorizations, are very substantial.

Data pertinent to analyses of public willingness to pay for recreation and fish and wildlife opportunities at Corps WRDPs are not generally available. Thus, recreation and fish and wildlife enhancement contributions to regional economic growth can only be inferred from a limited number of studies. For example, Knetsch found that a WRDP created a difference in land value that is a benefit attributable to the project comparable to the other forms of economic returns considered in project planning. Using data to approximate a TVA WRDP, he estimated average annual benefits of $160,677 in 1961 dollars. His work showed that these values are due mainly to the value of the project as a recreational and amenity resource.[b]

---

[a] U. S. Department of the Interior, Bureau of Outdoor Recreation, 1973. Op cit.

[b] Knetsch, J. L. 1964. "Influence of Reservoir Projects on Land Values". Journal of Farm Economics, Vol. XLVI, No. 1 (February).

At Isabella, a Corps WRDP, there was a change from a rural agricultural population of 1,000 to a tourist/recreation population of 5,900, following completion of the lake.[a]

A decade later, work at the Corps' Tenkiller Ferry WRDP suggests that recreation visitation, plus its corellary impact upon population, accounted for annual increases (in 1970 dollars) of $4.0 to $4.3 million in personal income in a relatively small two-county area.[b]

A study of four relatively small California WRDPs (7,012 to 10,796 acres) concluded that annual expenditures at or near the respective WRDPs which were attributable to its recreational usage were: $2.6 million at Lake Casitas, $4.4 million at Lake Berryessa, and $4.7 million at Lake Elsinore.[c]

Corps responsibility for more diverse land management seems destined to increase. The report of a special citizens group, acting at gubernatorial request, reviewed the Corps' comprehensive plan for the Connecticut River Basin and recommended a combination of alternatives to proposed structural solutions, including Federal land acquisition (Citizens Review Committee 1971).

C. Findings

a. The 407 existing Corps WRDPs constitute a nation-wide system of resource units comparable to the national park system, the national forest system, and the national wildlife refuge

---

[a] CZRC Case Study, Appendix D.

[b] Warner, L., D. D. Badger, and G. M. Lage. 1973. Impact Study of the Construction and Operation of the Tenkiller Ferry Lake, Oklahoma. Oklahoma State University, Stillwater Oklahoma.

[c] Ralph Stone and Company, Inc. 1971. Socio-economic Study of Multiple-use Water Supply Reservoirs. Office of Water Resources Research, Washington, D. C.

system.

(1) Forty-two of the forty-eight contiguous states contain one or more Corps WRDPs.

(2) Corps WRDPs occur within zones defined by landscape analysts as corridors of environmental quality. Lake size and diversity superimposed upon a high quality landscape provide an attractive setting for all classes of water-oriented recreation.

(3) During 1973, Corps WRDPs in the contiguous states sustained 262.4 million visitor days of use.

b. The present Corps WRDP system contributes significantly to Federal, state, and local recreation and fish and wildlife inventories. Corps land comprises:

(1) Approximately 1.2% (378,028 acres) of the land in USF&WS refuges and game ranges.

(2) Approximately 8.6% (743,926 acres) of state park acreage and 9.1% (1,440,245 acres) of state fish and wildlife lands.

(3) Approximately 2.4% (22,412 acres) of the area in municipal park systems and 1.8% (23,061 acres) of the land in county recreation use.

c. The Corps has broad statutory authority to plan, develop, and operate public recreation facilities, manage forest resources, cooperate in fish and wildlife management, and permit use and development of public land; but the authority is diffused throughout Federal law and is permissive rather than directive.

(1) Corps recreation-resources management programs at WRDPs completed prior to 1965 are premised on Section 4, Flood Control Act of 1944 (16 USC §460d), the Fish and Wildlife Coordination Act (16 USC §663d), and Section 1, Flood Control Act of 1938 (33 USC §540). The acts authorize public park and recreation facilities but only require adequate provision for wildlife resources when consistent with primary project pruposes.

(2) The Federal Water Project Recreation Act (16 USC §4601-12) requires that full consideration be given to outdoor recreation at all WRDPs completed after 1965 and requires cost sharing by non-Federal participants.

(3) A portion of the Corps' legal framework consists of the Clean Air Act (42 USC §1857f), Federal Water Pollution Control Act Amendments of 1972 (33 USC §§1323, 1341(a) (1), and 1368(a)), the Solid Waste Disposal Act of 1965 (42 USC §3254e (a) (1) et. seq.), the National Environmental Policy Act of 1969 (42 USC §4332), and other generally applicable Federal statutes.

CHAPTER 2

CASE STUDY METHODOLOGY

Analysis of the Corps' management of its extensive system of resource areas described in Chapter 1 was primarily based upon data gathered through intensive field study of a representative sample of existing WRDPs. It was therefore necessary to exercise great care in establishing the basic framework within which the field study would be executed. The objective of this chapter is to acquaint the reader with the process by which the individual WRDPs were selected to be case studies, the procedures guiding the collection of data from the related sample of WRDPs, and the manner by which the data gathered in the case studies were organized and presented.

A. Case Study Selection Factors

Criteria for the selection of the representative sample of existing WRDPs were established on the basis of CZRC's experience with the operation of Corps WRDPs and a preliminary reading by Fried, Frank, Harris, Shriver and Kampelman, CZRC's subcontractor, of those statutes identified by OCE as central to Corps authority in the fields of recreation, fish and wildlife, and land use.

The selection of a representative sample, from among 407 WRDPs nation-wide, was based upon two sources of national data provided by OCE: (1) Recreation-Resources Management System (RRMS 1973) computer output reports "A" through "H" as of 31 December 1973; and (2) a computer listing of all active out-

grantees on record with the Real Estate Directorate (RED) as of 31 December 1973, together with a description of each outgrant instrument.

Differences in the physical characteristics, the range and complexity of recreation and fish and wildlife programs, and the management practices at the WRDPs were related to 12 different selection factors. These factors are identified herein:

1. Geographic Location: The sample contained a minimum of at least two WRDPs within each Engineer Division. Further, twelve of the sixteen water resource regions recognized by the U. S. Water Resources Council were represented. Such a geographic range of WRDPs was thought to provide a range of hydrological, economical, environmental, and social settings which would be useful in comparing different effects and impacts.

2. Concentration of Corps Activity: The sample contained five WRDPs within the Ohio River Engineer Division, which had the largest number of WRDPs (127); four within the South Atlantic Engineer Division (33); four WRDPs within the Southwestern Engineer Division (70); three WRDPs within the North Central Engineer Division (52); three WRDPs within the North Pacific Engineer Division (27); and two WRDPs in each of the remaining five Engineer Divisions (average 20).

3. Land Acquisition Policies: On the assumption that the amount, configuration, and specified use of land acquired for authorized WRDP purposes depended upon legislative and/or Federal agency policy in effect at the time of land acquisition, WRDPs were selected which would represent the his-

torical evolution of policies affecting Corps reservoirs. For example, authorizations of the 29 sample WRDPs spanned 82 years of Corps activity (1880 to 1962).

4. Complexity of Shoreline Management: Two indices of shoreline management complexity were used. The first, total length of shoreline created by the WRDP, ranged in the sample from 9 to 2,250 miles (mi). The second, the number of permits, letters of authorization, or other instruments issued for piers, docks, and associated purposes, ranged in the sample from zero to 2,689.

5. Water Surface Management: Two indices of water surface management difficulty were utilized. The first, total water surface, ranged in the sample rrom 650 to 313,000 acres at normal pool elevation. The second index considered whether or not an interstate body of water was created by the WRDP. The sample included ten interstate water bodies.

6. Relation with Other Federal Agencies: The sample included eight WRDPs where project lands and resources interact with lands and resources administered by the USFS. At six of the selected WRDPs some Corps land and/or facilities are administered by the USF&WS, although one of those licensed to USF&WS is jointly managed with the BLM. Finally, three of the selected WRDPs involve the interests of Indian tribes.

7. Relations with State Governments: Application of this factor involved selecting those WRDPs showing the largest acreage outgranted to agencies of state governments. The sample includes four WRDPs where the entire project area, except that reserved for project operation, was outgranted to state agencies and nineteen where varying portions of project area have been outgranted to state agencies.

8. Urban vs. Rural Setting: The number of miles separating a WRDP from the nearest Standard Metropolitan Statistical Area (SMSA) was considered as an index of the urban impact upon the project. Five of the sample WRDPs are within five miles of an SMSA, fourteen are more than five but less than fifty miles from an SMSA, and the remaining ten are more than fifty miles from an SMSA.

9. Size of Corps Management Responsibility: The number of acres held in fee sample by the Corps is the index associated with this factor. WRDPs in the sample range from 188 to 589,774 acres.

10. Recreation Visitor Usage: WRDPs reporting large 1973 attendances, large numbers of Corps-managed recreation areas, and large numbers of commercial recreation outgrants were selected for comparison with WRDPs having smaller corresponding statistics, in order to reflect possible differences in management problems. Included in the sample are WRDPs which reported 10,432,900 visits, and have 24 commercial recreation outgrants directly issued by the Corps.

11. Interrelationships With Other Project Purposes: The ability to compare recreation and fish and wildlife management approaches with other project uses and purposes was enhanced by representing in the sample all possible project purposes according to RRMS 1973 data.[a]

---

[a]Unfortunately, Engineer Districts do not report "Project Purposes" in the same way. Some Districts report recreation and fish and wildlife as a "project purpose" for every project under the general authorities cited in Chapter 1; other Districts report only those purposes specifically authorized by Congress (usually the House Document, as reported in Chapter 1). CZRC case studies report only those purposes specifically authorized by Congress. The error in data used for sample selection may have weakened the examination and analysis of fish and wildlife problems.

12. Complexity of Real Estate Programs and Practices: The record of outgrants made for recreation and resource-related purposes (e.g., agriculture, grazing, private recreation, and quasi-public recreation) was examined and WRDPs with large numbers of outgrants covering a variety of uses and large acreages were included in the sample.

Comparisons of OCE data, tabulated and ordered according to the twelve selection factors, were instrumental in the identification of WRDPs to OCE as the sample. Following OCE review of the selection criteria and the recommended WRDPs, an additional WRDP was included in the sample by OCE, and CZRC was authorized to initiate the research and field work. The 29 WRDPs evaluated are shown on Figure 2-1.

B. Relevance of the Sample

The 29 WRDPs selected for evaluation encompass 28% of the project acreage and 35% of the shoreline miles of all Corps projects (Table 2-1), and 19% of the intensive Corps-managed recreational acreage at all Corps projects. They also account for 18% of the 1973 attendance at Corps areas. Sixty-eight percent of all attendance occurred at Corps-managed areas for the projects evaluated whereas nationally 63% of the total attendance at WRDPs was at Corps-managed areas.

The projects selected for study involve 18[a] Corps districts responsible for the administration of 240 projects

[a] RRMS 1973 data indicate the selected projects involve 19 engineer districts; jurisdiction of John Day was being transferred from the Portland Engineer District to the Walla Walla Engineer District during the study period.

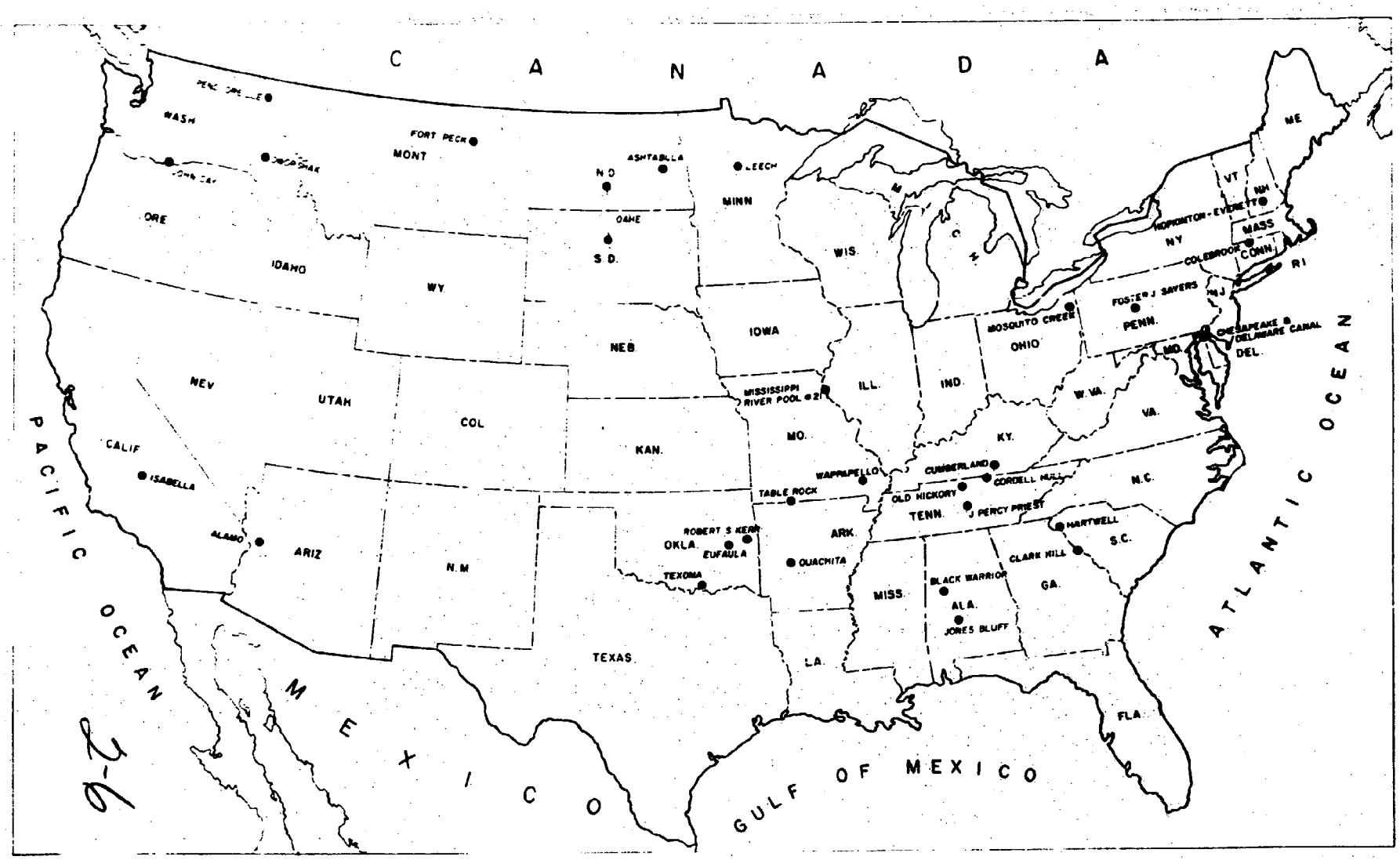


Figure 2.1 Water Resource Development Projects Studied

Table 2-1. Relationships Between the 29 Water Resource Development Projects Evaluated and All Corps Projects.

	Total Project Acreage	Total Acreage in Fee Simple	Total Shoreline Miles in Fee Simple (Actual)	Total Acreage Outgranted	Total Acreage in Intensive Recreation-Corps	Total Attendance all Recreation Areas: 1973 (Number of areas)	Total Attendance at Corps-Managed Recreation Areas: 1973 (Number of Areas)	% of Total 1973 Attendance at Corps-Managed Recreation Areas (% of areas)
29 WRDPs Evaluated	2,763,451[a]	2,201,056[a]	11,618[a] (12,723)	748,373[b]	46,684[c]	43,476,844[d] (571)	29,518,304[d] (447)	67.9 (78.3)
All Corps Projects	9,870,646[e]	6,401,864[e]	33,078[e] (43,279)	3,800,821[f]	241,723[g]	262,608,506[d] (2,718)	164,065,226[d] (1,911)	62.5 (70.3)
Case Study Sample as % of National Totals	28.0	34.4	35.1 (29.4)	19.7	19.3	16.6 (21.0)	18.0 (23.4)	-- --

[a] Appendix D, Case Studies, Resource Statistics Tables.

[b] Appendix D, Case Studies, Summary of Outgrants Tables.

[c] RRMS. 1973. 1973 annual reports for respective WRDPs. Office, Chief of Engineers, Washington, D. C.

[d] RRMS. 1973. Report D-4: total CY73 attendance at Corps projects with breakout of attendance occurring at Corps managed recreation areas and recreation areas managed by others. Office, Chief of Engineers, Washington, D. C.

[e] RRMS. 1973. Report D-8: land and water area at Corps projects. Office, Chief of Engineers, Washington, D. C.

[f] Office, Chief of Engineers. 1973. Outgrants-CW-active; outgrant listing of active grants (active as of 31 December 1973). Washington, D. C.

[g] RRMS. 1973. Report D-13: summary of land and water management (acres); division-district totals. Office, Chief of Engineers, Washington, D. C.

(59% of all Corps projects) which received a total 1973 attendance of 226,792,400 (67%), of which 105,021,767 (64%) were at 1,379 Corps-managed recreation areas (72%) (Table 2-2).

C. Data Collection

The data collection process followed a plan which was established and refined prior to the start of the actual field work. This plan included the preparation of a detailed format for data collection and a schedule for field work.

The data collection format was initially established in a Preliminary Development Scenario, a document based on preliminary information, postulated information requirements, and the need for data cross-checking and uniformity. Guidelines for the uniform collection of data during personal interviews were contained therein. Additionally, the scenario contained standardized procedures for defining an analytical unit, and for determining the regional setting or geographical perspective of each WRDP.

The field work schedule involved travel and appointments for six to eight personnel organized into three to four survey teams over a 15-week period to inpsect and to analyze each of the sample WRDPs. Each survey team consisted of a basic two-person crew; one member specializing in planning/administration and one specializing in fish and wildlife biology. When warranted by complexity, additional personnel were added to the basic team assigned to a specific WRDP. The maximum field strength for a single project was four for Old Hickory and J. Percy Priest.

Prior to each field survey, the evaluation team was provided with a package of existing data which characterized the specific WRDP to be visited. Data consisted of RRMS 1973

Table 2-2. Characteristics of Districts Containing the 29 Water Resource Development Projects Selected for Study.[a]

District	Number of Projects	Attendance - all Recreation Areas: 1973	Total Number of Recreation Areas	Attendance - Corps-Managed Recreation Areas	Total Number of Corps-Managed Recreation Areas
Baltimore	6	974,300	6	0	0
Little Rock	20	25,913,200	153	11,614,800	143
Los Angeles	8	5,340,100	13	0	0
Memphis	1	1,743,800	19	1,526,695	12
Mobile	18	32,582,100	282	10,816,754	241
Nashville	8	26,391,600	226	13,265,700	168
New England	31	4,546,600	65	3,131,600	42
Omaha	10	10,402,700	152	5,027,200	104
Philadelphia	4	991,900	5	504,459	3
Pittsburgh	36	12,371,200	75	5,093,700	52
Rock Island	14	16,688,100	201	3,767,200	37
Sacramento	8	3,012,700	34	2,288,440	30
Savannah	3	12,188,400	156	5,426,201	129
Seattle	5	1,450,800	17	1,504,840	16
St. Paul	26	12,102,900	36	2,038,200	32
Tulsa	27	41,791,000	277	24,826,715	226

Table 2-2. (Continued)

District	Number of Projects	Attendance - all Recreation Areas: 1973	Total Number of Recreation Areas	Attendance - Corps-Managed Recreation Areas	Total Number of Corps-Managed Recreation Areas
Vicksburg	7	13,733,000	117	11,812,500	106
Walla Walla	8	4,568,000	59	2,376,763	38
Study District Totals	240	226,792,400	1,893	105,021,767	1,379
National Totals	407	339,097,900	2,718	164,065,226	1,911
Study District Totals as % of National Totals	59.0	66.9	69.6	64.0	72.2

[a]RRMS. 1973. Report D-4: total CY73 attendance at Corps projects with breakout of attendance occurring at Corps managed recreation areas and recreation areas managed by others. Office, Chief of Engineers, Washington, D. C.

data, a RED listing of active outgrants, project brochures, and U. S. Geological Survey maps at 1:250,000 and 1:24,000 scale.

Engineer District, state, and WRDP site visits were made for each WRDP selected for study. In the Engineer District Offices, interviews were generally held with personnel in the engineering, planning, operations, and real estate divisions and their respective branches and/or sections. In addition to the collection of policies, practices, opinions, and file data during the interviews, numerous project documents (such as real estate and public facilities design memoranda) and related literature were obtained. At the state level, information was generally collected from personnel within state planning, fish and wildlife, parks and recreation, pollution control, and other recreation resource and environmental agencies. At each WRDP site, Corps project personnel, and other Federal (e.g., USF&WS and USFS), state, local, and regional personnel provided information through interviews, file material, project literature and reports, and by guided field tours. More limited contacts were also made with home, business, and land owners in that part of the analytic unit contiguous to the project area, and personnel from banks and savings and loan institutions, citizens groups, homeowner associations, and independent governmental agencies (e.g., the Missouri River Basin Commission). Efforts were made during all field visits to interview personnel who were familiar with or had first-hand knowledge of the WRDP under consideration.

Data and information gathered during the field surveys varied significantly in scope and detail. Uniform, comparable quantitative information on a range of topics originally

outlined in the Development Scenario, such as water quality, private sector impacts, contribution to local tax bases, and effect on local community facilities and services, were generally not available. Qualitative information concerning these and other factors was gathered when available. Quantitative information was, however, available for factors such as acreage outgranted, project area, visitation, area population, and Corps organization. In some instances, this information was in conflict with information compiled by field crews from OCE sources before going into the field. Further, there were also instances in which the information concerning a particular WRDP gathered from district, state, and local sources appeared to be in conflict. Upon returning from the field, frequent follow-up discussions with district and project personnel concerning particular WRDP data conflicts aided in clarifying some of the discrepancies.

D. Data Presentation

The data collection for each WRDP visited was presented in a standardized case study report format which was organized to facilitate (1) a discussion of quantitative and qualitative information (including data gaps or conflicts), (2) a detailed consideration of each individual WRDP, and (3) comparisons of data among WRDPs. Four major headings were selected as the means of data presentation:

1. Setting: Considered under this topic was the geographic and jurisdictional location of the WRDP and, where appropriate, population, proximity to major urban areas, key transportation routes, travel distances, and the WRDP's proximity to other related projects. A map of the WRDP showing significant locational features was presented. Authorized

purposes and legislative citations were provided. Significant features of the WRDP including drainage area, lake size at various pool levels, total project acreage, engineering and operational considerations, and topographical characteristics were given. Resource statistics for each WRDP were tabulated according to a standard format so entries among the WRDPs could be compared.

2. Land use, recreation, and fish and wildlife considerations: A statement of the analytical unit for each WRDP provided background information concerning WRDP impact on the surrounding area, impact of the surrounding area on the WRDP, and general land use considerations. Discussions about ownership indicated the extent of public and private interests in land within the analytical unit.

Each identified WRDP resource was considered in terms of its characteristics, responsible agency, and overall management and utilization. Recreational opportunities, facilities, and usage at a WRDP were discussed in terms of location, responsible agency, and contribution to recreational clientele. Lake resources (including the fishery, water quality, and water utilization) and the management of wildlife resources were also discussed. Other uses of land within and adjacent to a WRDP were considered, including forestry, mineral extraction, agriculture, and grazing. Where appropriate, outgrant data were tabulated for various purposes, including type of instrument, effective date and term, rental basis and annual rent, and non-Corps and Corps investments. Special emphasis was accorded concessioners. The existence and utilization of resource use controls were discussed in terms of agency responsibilities and effectiveness.

Corps organization at the district and field level was also discussed and depicted in an organization chart.

3. Key findings: Significant findings representing problem areas, data conflicts, resource management approaches, agency relationships, and viable program practices were discussed under several major categories. The categories include: (a) recreation, (b) fish and wildlife, (c) Corps and contiguous land use, (d) real estate programs and practices, (e) Corps organization, and (f) environmental problems.

4. References: This section lists all reference materials which were utilized in preparing each case study.

E. Summary of Sample Case Study Characteristics

The 29 WRDPs selected for evaluation are located in diverse geographic areas throughout the nation, in or partially in 26 states, with a combined acreage of 2,763,451 (Table 2-3). Total shoreline miles of the WRDPs evaluated are 12,723 with a total water surface area of 1,428,633 acres (at the average recreation pool elevation excluding the Chesapeake and Delaware Canal). Flood control and power were the most common project purposes, cited in 72% and 69%, respectively, of the cases studied; navigation was also a frequently listed project purpose, cited in 41% of the cases studied. Impoundment at 43% of the WRDP analyzed occurred since 1960; impoundment at 25% of the cases studied was prior to 1950.

Outgranted acreage varied from zero (Colebrook) to 128,114 (Texoma) with an average of 25,806 (Table 2-3). The summer recreation season water fluctuation ranged from zero (at several projects) to 65-70 feet (Colebrook).

Table 2-3. Resources Characteristics of Water Resources Development Projects Selected for Evaluation.

WRDPs	Case Study Number	Location: State(s)	Date of Impoundment[a]	Project Purposes[b]	Project Acreage[a,c]	Shoreline Miles[a,c]	Lake Size (acres)[c,d]	Water Fluctuation-Summer Recreation Season (ft)[a]	MRL-Manageable Resource Lands (acres)[a]	MRL Ratio: MRL/Shoreline Miles in Fee Simple[a]	Acreage Outgranted[a]	Intensive Corps plus Outgranted Public Recreation Acreage[c,f]	Total Attendance at All Recreation Areas: 1973[g]	Highest Use Category (% use)[h,i]	Corps Recreation Investment to 1974 ($)[j]
Wappapello	1	Missouri	1941	FC	44,396	180	8,400	3	35,225	196	37,170	2,779	1,709,033	S (44%)	662,500
Ouachita	2	Arkansas	1953	FC,P	82,173	690	40,060	8	42,231	61	4,276	2,021	2,530,900	S (43%)	4,138,200
Fort Peck	3	Montana	1937	FC,P,N,I	610,085	1,520	215,000	2.5-3.5	380,774	351	101,189	1,674	691,100	S (36%)	1,325,000
Oahe	4	South & North Dakota	1953	FC,P,N,I	477,883	2,250	313,000	7-9	158,376	70	80,545	2,271	1,090,900	F (55%)	5,025,000
Colebrook	5	Connecticut & Massachusetts	1969	FC,WS	1,411	13	760	65-70	173	13	0	18	103,300	S (73%)	260,000
Hopkinton-Everett	6	New Hampshire	1963	FC	10,018	40	595	1-2	6,740	169	6,754	254	183,900	S (43%)	518,000
Foster J. Sayers	7	Pennsylvania	1969	FC	7,991	20	1,730	20	5,350	268	7,151	6,095	174,056	S (69%)	3,812,000
Chesapeake & Delaware	8	Delaware & Maryland	1919[k]	N	15,293	27	NA[l]	3.5	7,519	235	7,109	2	160,200	S (60%)	197,319
Mississippi River Pool 21	9	Illinois & Missouri	1936	N,FC	14,800	146	6,350	NA	7,667	63	6,968	455	3,132,400	F (58%)	76,775
Ashtabula	10	North Dakota	1951	FC,WC	8,483	78	5,626	3.5	2,367	30	1,576	395	600,600	F (65%)	425,573
Leech	11	Minnesota	NA	N	225,792	51	125,900	0.4	NA	NA	21	75	69,600	C (65%)	184,777
Pend Oreille	12	Idaho	1952	P	113,182	226	94,600	10	NA	NA	4,824	116	265,040	SW (48%)	416,600
John Day	13	Oregon & Washington	1968	N,FC,P	76,600	240	30,000	3	27,023	113	22,689	1,112	1,121,158	S (70%)	8,510,000
Dworshak	14	Idaho	1971	FC,P	48,127	175	16,970	0	29,923	171	7	307	230,600	S (65%)	2,610,000
Cordell Hull	15	Tennessee & Kentucky	1973	N,P	32,822	381	11,960	1	20,260	65	6,833	2,565	99,900	S (48%)	3,283,000
Cumberland	16	Kentucky	1950	P,FC	101,383	1,085	50,250	50	45,213	46	44,253	3,544	4,267,400	F (35%)	710,000
Old Hickory	17	Tennessee	1954	P,N	34,189	440	22,500	8	7,921	22	41,073	1,708	3,260,000	F (40%)	1,120,000
J. Percy Priest	18	Tennessee	1967	FC,P,R	33,662	213	14,200	14.5	18,889	87	5,937	7,609	2,218,500	S (50%)	5,510,000
Mosquito Creek	19	Ohio	1944	FC,LWR	11,489	44	7,300	5.4	3,200	73	11,006	5,651	1,436,030	F (52%)	86,000
Black Warrior	20	Alabama	1915	N	9,374	300	39,973	0	579	14	<1	2,576	361,900	F (50%)	166,100
Jones Bluff	21	Alabama	1972	N,P	24,568	368	13,300	0	3,318	107	525	4,190	64,700	F (85%)	411,600
Clark Hill	22	Georgia & South Carolina	1951	FC,N,P	155,886	1,060	71,531	5	81,401	77	44,614	13,883	3,180,064	S(25%),F(25%)	1,485,000
Hartwell	23	South Carolina & Georgia	1961	FC,P	80,159	962	55,950	5	22,406	23	33,506	2,274	4,623,423	F (36%)	2,648,500
Alamo	24	Arizona	1968	FC,WC,P	22,856	9	556	2	11,847	1,316	27,749	4,893	62,000	F(29%),C(29%)	463,000
Isabella	25	California	1952	FC,I	16,000	30	6,520	42	8,180	273	5,196	226	761,790	F (77%)	1,300,600
Table Rock	26	Missouri & Arkansas	1958	FC,P	60,694	745	43,100	12	14,305	19	52,537	3,197	1,948,100	F (50%)	2,226,400
Eufaula	27	Oklahoma	1964	FC,P	183,859	600	102,500	10	51,319	86	63,226	10,221	1,047,000	S (60%)	3,609,900

Table 2-3. (Continued)

WRDPs	Case Study Number	Location: State(s)	Date of Impoundment[a]	Project Purposes[b]	Project Acreage[a,c]	Shoreline Miles[a,c]	Lake Size (acres)[c,g]	Water Fluctuation-Summer Recreation Season (ft)[a]	MRL= Manageable Resource Lands (acres)[a]	MRL Ratio: MRL/Shoreline Miles in Fee Simple[a]	Acreage Outgranted[e]	Intensive Corps plus Outgranted Public Recreation Acreage[d,f]	Total Attendance at All Recreation Areas: 1973[g]	Highest Use Category (% use)[h,i]	Corps Recreation Investment to 1974 ($)[j]
Robert S. Kerr	28	Oklahoma	1970	P,N	65,706	250	42,000	2	20,981	84	23,453	4,250	680,590	F (33%)	1,458,000
Texoma	29	Oklahoma & Texas	1942	FC,P	194,350	580	89,000	5	77,659	134	128,114	9,379	5,733,500	F (58%)	3,431,000
TOTAL	--	--	--	--	2,763,451	13,723	1,426,633	--	1,091,046	--	748,373	92,952	33,476,844	--	54,838,044
AVERAGE	--	--	--	--	95,291	439	51,023	--	40,409	94	25,806	3,205	1,499,202	--	1,890,967

[a] Appendix D, Case Studies, Resource Statistics Tables.

[b] Appendix D, Case Studies, Section IC: Features; FC= flood control, P= power, N= navigation, I= irrigation, WS= water supply, FC= flood control WC= water conservation, R= recreation, LWR= low-water regulation.

[c] At average recreation pool elevation.

[d] ARMS. 1973. 1973 annual reports for respective WRDPs. Office, Chief of Engineers, Washington, D. C.

[e] Appendix D, Case Studies, Summary of Outgrants Tables.

[f] Appendix D, Case Studies, Tables of Outgrants for Recreation--Public Parks.

[g] RUMS. 1973. Report D-4: total CY73 attendance at Corps projects with breakout of attendance occurring at Corps managed recreation areas and recreation areas managed by others. Office, Chief of Engineers, Washington, D. C.

[h] RUMS. 1973. Report D-5: recreation use patterns at Corps projects, percent of activity use, and average attendance on weekend day during peak month. Office, Chief of Engineers, Washington, D. C.

[i] S= sightseeing, F= fishing, P= picnicking, C= camping, SW= swimming.

[j] Personal communication, November 1974. All respective Corps of Engineer Districts.

[k] Date of full operation.

[l] Not applicable.

similarly, project recreational acreage (intensive Corps recreation areas plus outgranted areas for public parks and recreation) was quite variable and averaged 3,205 for the 29 projects evaluated. Total attendance (1973) at all recreation areas was 43,476,844 for the 29 cases studied with an average of 1,499,202 per project. The lowest attendance occurred at Alamo (42,000) whereas attendance was highest at Texoma (5,723,500). Sightseeing and fishing were the two most popular activities. Corps recreational investments as of 1974 totalled $54,838,044 for the projects evaluated.

There were 5,773 instruments in effect that outgranted 740,419 acres of land to Federal, state and local agencies, quasi-public organizations, and private individuals. The recorded investments made in facilities and improvement at the 29 WRDPs were $28,585,699. The annual rent paid was $656,087. The outgrants verified in the field are summarized in Table 2-4.

The 29 case studies produced a substantial body of data representative of the Corps' management of multi-purpose WRDPs throughout the United States. As expected, WRDPs that have been authorized, constructed, and operated in response to social and economic conditions during an 80-year span exhibit great diversity and present complex conceptual problems for orderly analysis.

Several permutations of the available quantitative data were undertaken in an effort to find distinctive features of WRDPs around which certain resource management problems and implications would gravitate.

It seemed a reasonable assumption, for instance, that there would be a direct relationship between the size of a WRDP and the complexity of resource oriented problems

Table 2-4. Summary of Outgrants for the Case Studies

Purpose	Number of Outgrants	Acreage	Annual Rent Paid ($)	Investment to 1974 ($)
Fish & Wildlife	51	464,074	0	371,859
Public Parks	70	43,332	0	13,128,225
Commercial Recreation	117	3,890	179,418	13,115,171
Quasi-public Recreation	97	7,036	178	1,693,400
Agriculture & Grazing	728	147,948	353,692	N/A
Others	4,710	74,139	122,799	277,044
Total	5,773	740,419	656,087	28,585,699[a]

[a] Not complete. Not all districts had records of total investments for all purposes.

associated with it. However, ranking of the 29 WRDPs from smallest to largest with associated data did not substantiate such a relationship. Similarly, rankings according to total fee simple acreage, number of outgrants, shoreline miles, authorized purpose, proximity to SMSA, or total visitation did not establish a clear relationship between the feature and the problems. Particular attention was accorded to segregation of WRDPs according to the dates of authorization and of impoundment because of a general belief that Corps recreation-resource management problems have a high correlation with WRDPs built in periods when national policy severely limited land acquisition. Again, there was no clear relationship between this WRDP characteristic and management problems identified in the field.

The raw data obtained from literature, interviews, and observation were organized according to the data collection formats, then analyzed to identify significant points with respect to the specific objectives of the study. Preparation of internal summaries and evaluations of conditions, or key findings, for each WRDP was the first step in analysis.

Key findings were organized by category of major concern (recreation, fish and wildlife, Corps and contiguous land use, real estate programs and practices, environmental problems, and Corps organization at the Engineer District and field levels). Facility cleanliness, impact of water level fluctuation, site condition, and planning processes were noted under recreation. Level of fishery management, water quality, and type of habitat management were noted under fish and wildlife enhancement. Effectiveness of state and local land use and building controls, use of shorelands, and allocation of Federal

land were noted under Corps and contiguous land use. The condition of concessioner operated facilities, encroachment and trespass upon Corps administered land, and procedures for leasing land for agriculture and grazing were noted under real estate programs and practices. The qualifications of resource management responsibilities among elements of district offices, and relationships between district staffs and on-site personnel were noted in the environmental problems section.

Discrepancies and conflicts between field data and RRMS 1973 data, and between RRMS 1973 data and RED 1973 data, were identified and documented. Most of the discrepancies discovered were of a random nature, possibly offsetting, and did not appear to result from bias, except for visitation. Visitation reports for state operated recreation areas were compared with visitation reported to OCE by the Engineer Districts. The Corps reports were consistently higher than the state reports. In addition, many districts use a 3.8 occupants per vehicle load factor during all seasons to obtain visitor totals. At WRDPs with active monitoring programs, non-summer load factors can be as low as 1.8. Thus, visitation seems overstated. None of the conflicts or discrepancies known to exist within the resultant data base are believed to be of such significance as to affect any of the conclusions of the analyses of sampled WRDPs. The data base is considered complete and comprehensive and provides an adequate basis for the evaluation of the complete range of problems and management opportunities existing nationally at Corps WRDPs.

CHAPTER 3

ANALYSIS OF CASE STUDY DATA

The analysis of case study data was undertaken with the objective of establishing a framework within which meaningful conclusions could be drawn and constructive recommendations formulated. To this end, particular emphasis was devoted to the identification of potential and actual problems, both present and future. This emphasis, however, should not be taken to imply that the case study data indicated only problems. Indeed, as shall be made clear from the material in this and subsequent chapters, much which is positive has been found.

Physical characteristics peculiar to individual WRDPs impose constraints on defining specific land uses and their relationships to Corps management programs and make it difficult to generalize about the present situation. The most significant of these physical characteristics stem from the variable water surface elevation, typical of most WRDPs, which, in turn, directly affects the amount of land available for management at different times of the year. Thus, water surface elevations in WRDPs which generate sufficient amounts of hydroelectric power may vary according to a daily cycle, WRDPs which are largely operated for flood control may show very large seasonal water surface elevation variations, while WRDPs designed in conjunction with navigation locks may have water surface elevations that vary only 1 or 2 feet during the year. All variations are subject to natural seasonal variations in the drainage area and river flows.

To facilitate the description and discussion of the Corps resource management programs in light of such

peculiarities in the physical characteristics of individual WRDPs, it was helpful to establish a uniform meaning to the following terminology:

1. Land permanently inundated: Land lying below the lowest water elevation (sometimes called the conservation pool) subject to permanent inundation, and as such, able to support permanent benthic communities and associated aquatic resources.

2. Land periodically inundated: Land lying between that which is permanently inundated and the elevation of the spillway (including flood-prone areas) subject to periodic inundation whose value for recreation and fish and wildlife enhancement varies with the frequency, periodicity, and duration of inundation, as well as the topography. For example, gently sloping areas covered by shallow water may be valuable as waterfowl habitat or fish nurseries.

3. Land never inundated: Land lying above the elevation of the spillway not subject to inundation which can be utilized for a number of purposes.

4. Project operations land: Land utilized by the managing agency for project works such as dams, locks, powerhouses, administrative buildings, and as safety zones on the tailraces and/or lake side of the dam.

5. Manageable Resource Land (MRL): The residual area derived by subtracting from the total reported project area for a WRDP the following areas: (1) the acreage inundated at normal pool elevation[a], (2) the acreage for which the

[a] Neither the term normal pool elevation nor an equivalent elevation is consistently applied by Engineer Districts. RRMS selects the elevation and area that represents the size of the impoundment during the majority of the year.

Corps has only easements or lesser interests above the normal pool; and (3) the acreage designated as necessary for project operation.

A very useful tool introduced to facilitate the analysis of the use of Corps lands for recreation, fish and wildlife enhancement and other resource management purposes is the MRL unit concept. While not perfect, this concept, and that of the corresponding MRL ratio, significantly contributes to the understanding of the problems associated with resource inventory and usage.

The applicability and usefulness of the MRL unit in describing particular WRDPs may be seen in the following examples.

The Old Hickory WRDP has a total project land acreage of 34,184. However, (1) 25,838 acres of the land is actually owned in fee simple, and 8,351 acres of the land is under easement or some interest less than fee or is former river bed; (2) at normal pool elevation, 22,500 acres of the total project are inundated and are therefore subject to aquatic management rather than land management; (3) there are 117 acres of project operations land; such that (4) only 7,921 acres of the 34,184 total acres within Old Hickory are actually subject to resource management.

Further, use of the MRL unit to compare WRDPs represents a more accurate picture of management problems and approaches than total project land or any one of the 12 selection factors identified in Chapter 2. For example,

comparison of Old Hickory and J. Percy Priest on the basis of total project land (34,184 and 33,662 acres, respectively) could lead to the conclusion that management considerations are similar. Comparison of the MRL of these two WRDPs (7,921 acres and 18,889 acres, respectively), however, indicates that management considerations at the two WRDPs are significantly different.

The use of different terms for elevation and different use classifications as applied to WRDP lands, however, causes some difficulties in using the MRL unit as a single standard for comparing all WRDPs.

For example, at Leech and Pend Oreille, the MRL unit cannot be calculated on the basis of existing data because these WRDPs were natural lakes prior to Corps operations and Corps fee ownership patterns consist of isolated parcels of land with an easement acreage greater than that held in fee simple.

As a second example, at Hopkinton-Everett, the majority of MRL is subject to inundation. Small areas may be inundated for up to 30 days each year and many acres may be inundated for a similar period only once every 35 years. The MRL area is nonetheless still manageable for timber, wildlife, and extensive recreation activity.

Finally, as an example of classification difficulty, approximately half of the fee simple acreage at the Chesapeake and Delaware Canal is classified as project operations land and is utilized for dredged material disposal. These lands, however, can be construed as manageable resource areas because current knowledge concerning disposal of

dredged material and its usefulness in creating artificial habitat is directly applicable to this WRDP.

A weighted ranking enhances the usefulness of the MRL unit. This ranking is represented by the ratio of MRL acreage to the number of shoreline miles held in fee simple and is termed the MRL ratio. With respect to the 29 WRDPs considered, this ratio is highest at Alamo (1,316), lowest at Colebrook (13), and has an overall average of 94. MRLs for Hartwell and Robert S. Kerr are similar: 22,406 acres and 20,983 acres, respectively. Hartwell Reservoir, however, has 962 miles of shoreline in fee simple whereas Robert S. Kerr has 250 miles. By calculating the MRL ratio, it can be seen that the former has only 23 acres of MRL per shoreline mile while the latter has 84.

Although Hartwell has more problems in terms of site overuse, concessioner turnover, and contiguous development, the difference in MRL ratio alone does not establish a clear cause and effect relationship. The MRL ratio does, however, provide an extremely useful means of grouping WRDPs as the basis for discussing their characteristics and problems and for considering alternative management approaches which are applicable.

The final step in the analysis was iteratively to examine the case study statements in each category of major concern (key findings) in terms of identifying significant positive and negative conditions, the causes and consequences of such conditions, the frequency with which they occur, and the effectiveness of various Corps efforts to deal with them.

A. Recreation

Evaluation of outdoor recreation facilities involves consideration of subjective factors such as variation in the quality of human experience as well as objective factors such as the number of units designed and designated to accommodate fixed numbers of recreationists. For example, a site with extensive facility development may experience crowding which may be satisfying for some recreationists but repugnant to others.[a] Only direct polling of visitors (to ascertain their perception of how well their experiences compared with their expectations) can uncover these subtle and subjective interactions. Established units of supply may be based upon acres of land designated for a particular use, such as linear feet of beach, or upon the number of facilities, such as tables, grills, tent pads, or parking spaces actually installed and available for use. These kinds of data are easily quantified, and are used extensively in this study. They alone, however, cannot adequately characterize the impact of the Corps' recreation program.

The complexity is further magnified at Corps WRDPs by three separate but interrelated mechanisms for providing visitor services: (1) land, water, and facilities (some of which have been designed and built by the Corps) that are managed by other public entities, such as state and local park agencies, (2) facilities and services offered by commercial establishments which may operate either on Federal land under concession leases or on land adjacent to Federal property with permitted access to the shoreline across Federal land; and (3) facilities designed and built by the Corps which are operated directly by Corps personnel.

[a] Hart, W. J. 1966. A Systems Approach to Park Planning, IUCN. Morges, Switzerland.

It was the intent of this part of the study to determine the efficiency and effectiveness of the Corps' management of its recreational facilities and areas. On the basis of the analysis of the data gathered during the field surveys, many examples of the good practice in the Corps' management of its recreation resources can be cited. Additionally, areas were identified in which the Corps' management can be strengthened.

First consider examples of good management practices. The physical cleanliness and maintenance of Corps recreation facilities, particularly comfort stations, was rated excellent at 28 of 29 WRDPs in spite of some reported overuse, discussed later. Uniformed, well equipped ranger patrols were evident at high recreation-use WRDPs. All project resource management staffs were cognizant of the need for regular measurement of the characteristics of visitors to their WRDPs and they conscientiously sample visitors according to OCE guidelines. Recreation area rotation was being implemented at Hartwell to offset site deterioration from heavy use. The Little Rock Engineer District contract with the Missouri Department of Conservation (Table Rock and other non-study WRDPs) for planning and performing intensive recreation area vegetation management is a model that other recreation area managers can emulate. Initiation of lakeshore planning during the public facilities planning process at Cordell Hull is now being implemented system-wide. Some new campgrounds and other public use facilities that were sited on the ground by the designer in company with a resource manager (New England Division) are as well designed as any campgrounds in the country.

Now consider areas in which the Corps' management of its recreation resources can be improved. These areas principally involve the overuse of intensive recreation use areas and the existence of excessive recreation capacity. Additional miscellaneous areas are also addressed.

1. Overuse of Corps Intensive Recreation Use Areas

The overuse of recreation lands and facilities could readily be detected by two principal indicators: (1) the physical deterioration of a site marked by soil compaction and erosion and damage to vegetative cover; and (2) the number of permits for private docks and access to the water and applications for new permits. Other, more subjective indicators of overuse include law enforcement responses to crowd disorder, vandalism, and increasing conflicts among various types of recreationists.

CZRC survey teams were alert to evidence of site deterioration in intensive recreation areas. The overuse of terrestrial environments at Corps WRDPs were documented by direct observations, by discussions with Corps field personnel, and by examination of use records. Visible site deterioration attributable to overuse was found at 11 WRDPs: Pend Oreille, Texoma, Wappapello, MRP #21, Cumberland, Isabella, Clark Hill, Hartwell, Old Hickory, Ouachita, and Table Rock. Eight of these WRDPs were constructed before 1952 whereas only three were constructed in the post-1952 period. Thus, site deterioration appears to be more pronounced at older WRDPs, a fact with significant management implications.

The Corps administered 291 intensive recreation areas at the 11 WRDPs where site deterioration was observed. These represent 65.1% of 477 intensive recreation areas administered by the Corps in the sample. Recreation visits by 29,518,304 persons to these 291 intensive recreation areas was reported in 1973. The average size of the recreation areas at the 29 WRDPs is 104.4 acres; the average acreage in the 11 WRDPs where deterioration is a problem is 67.7 (Table 3-1). However, acres per site, per se, may not be indicative of site deterioration since the average ranges from 165.5 acres per site at Texoma to 7.5 acres per site at Old Hickory, both of which exhibited deterioration.

Overuse of recreation areas leads to accelerated deterioration of facilities, such as tables, comfort stations, access roads, and internal circulation roads and trails. Evidence of facility overuse was reported at Texoma, Wappapello, Old Hickory, Isabella and J. Percy Priest. Note that at the first four of these WRDPs facility deterioration co-exists with site deterioration. J. Percy Priest exhibited only accelerated facility deterioration, a circumstance possibly explained by the newness of the WRDP, the incomplete status of facility development, and heavy use caused by close proximity to an expanding metropolitan area.

Table 3-1 compares the intensity of visitor use at Corps administered intensive recreation areas. The 11

Table 3-1: Comparison of Water Resource Development Projects Reporting Overuse by Category

Category	Water Resource Development Project	Corps Managed Recreation Areas					
		No. of Areas	Acres	Average Size	1973 Visitation[a]	Visits per Area	Visits per Acre	MRL Ratio
1890-1943								
	Texoma	41	6785	165.5	4,772,600	116,405	703	134
	Wappapello	12	920	76.7	1,526,695	127,224	1,659	196
	MRP #21	3	419	139.7	174,400	58,133	416	63
	Cumberland	19	163	8.6	1,937,900	101,994	11,889	46
Category Total		75	8287	110.5				--
1944-1952								
	Pend Oreille	7	116	16.6	265,040	37,863	2,285	--[b]
	Isabella	13	200	15.4	761,790	58,599	3,809	273
	Clark Hill	49	6,239	127.3	1,681,777	34,322	270	77
	Ouachita	18	1,651	91.7	2,302,800	127,933	1,395	61
Category Total		87	8,206	94.32				--
1953-1974								
	Hartwell	79	1,285	16.3	3,326,124	42,103	2,588	23
	Old Hickory	30	224	7.5	761,790	78,487	10,512	22
	Table Rock	20	1,691	84.5	1,585,500	79,275	938	19
Category Total		129	3,200	24.8				--
Totals Reporting Overuse		291	19,693	67.7	18,569,226	63,812	943	
Sample Totals		447	46,684	104.4	29,518,304	66,036	632	
o/o of Sample		65	42	--	62.9	--	--	

a. RRMS 1973 (Corps Administered Areas Only)
b. Natural lake

WRDPs where site deterioration is occurring account for 62.9% of 1973 visitation to all Corps administered recreation areas in the sample. Most unusual is the extreme range in visitor pressure expressed in visitors per acre per year: from a low of 270 to a high of 11,889.

The second major indicator of the overuse of recreation areas is the number of permits and permit applications for private docks and access to the water. Public use of the shoreline and the shallow offshore area is preempted when private docks occupy all available shorelands. The potential for localized overuse exists in shifting this strip-like shoreland use to a central marina. Increased pressure for private dock permits was reported at Pend Oreille, Jones Bluff, Eufaula, Table Rock, Texoma, Hartwell, and Old Hickory; representing 24.1% of the sample (Table 3-2).

The greatest pressures occur at WRDPs with very low MRL ratios (Table Rock, Hartwell, and Old Hickory). The expanding pressure at the Jones Bluff and Eufaula WRDPs with moderate MRL ratios, is explained by proximity of the projects to urban centers (Montgomery, Alabama, and Oklahoma City, Oklahoma, respectively) and the construction of new suburban housing near the project lands. The pressure at Texoma is largely centered upon areas that were originally leased as seasonal cottage sites and subsequently sold to private owners. Pend Oreille is included although no existing Title 36 CFR permits are reported in the RRMS systems, because the lake was a navigable body of water prior to project construction. The U. S. did not acquire fee title to tracts of land above the elevation of the maximum power

Table 3-2: Comparison of the Number Special Shoreland Permits by Category

Category	Water Resource Development Project	o/o of WRDPs in Sample	MRL Ratio	No. Title 36 Shoreline Permits[a]	o/o of Permits in Sample
Low MRL Shoreline Ratio					
	Colebrook	--	13[b]	0	
	Ashtabula	--	30	50	
	Cumberland	--	46	287	
	Old Hickory	--	22	1,230	
	Black Warrior	--	14	300	
	Hartwell	--	23	2,689	
	Table Rock	--	19	945	
Category Total		24.1	--	5,501	73.8
Medium MRL Shoreline Ratio					
	Wappapello	--	196	158	
	Ouachita	--	61	62	
	Oahe	--	70	20	
	Hopkinton-Everett	--	169	0	
	Miss. River Pool #22	--	63	0	
	Leech	--	--c	0	
	Pend Oreille	--	--c	0	
	John Day	--	113	10	
	Dworshak	--	171	0	
	Cordell Hull	--	65	0	
	J. Percy Priest	--	87	2	
	Mosquito Creek	--	73	21	
	Jones Bluff	--	107	0	
	Clark Hill	--	77	681	
	Eufaula	--	86	386	
	Robert S. Kerr	--	84	5	
	Texoma	--	134	555	
Category Total		58.6	--	1,900	25.5
High MRL Shoreline Ratio					
	Fort Peck	--	251	50	
	Foster J. Sayers	--	268	0	
	Chesapeake & Delaware Canal	--	235	3	
	Alamo	--	1316	0	
	Isabella	--	273	0	
		17.3	--	53	0.7
Grand Totals		100	--	7,454	100

a. RRMS 1973
b. Excludes Metropolitan District Commission of Hartford land
c. Natural lake

pool and does not control the riparian land. Thus, Corps involvement stems from the provisions of Section 10, River and Harbor Act of 1899, charging the Corps with responsibility to protect the navigable waters of the U. S.[a]

Finally, consider the more subjective indicators of overusage. An example of increasing conflicts among various types of recreationists is typified by the conflicts between fishermen vs. docks in the heads of coves and other shallow areas, and recreation boaters who enjoy beaching for picnicking vs. permanent and seasonal residents who own docks and landscape the federal shorelands to obtain pleasant vistas.

Preparation of Lakeshore Management Plans (authorized by 36 CFR 327.30) is a positive step to prevent growth of further user group conflicts. Such conflicts were revealed in the public hearings conducted by the Savannah Engineer District to receive citizen reaction to lakeshore management proposals for the Clark Hill and Hartwell WRDPs. Strong support was received for Corps proposals to limit the amount of shoreland at Clark Hill on which private and quasi-public facilities would be permitted /~~6~~81 permits are reported, (RRMS 1973) most of which are for quasi-public facilities, and relatively few barriers to fisherman use of the lake exist/. Reaction to Corps proposals for Hartwell were divided

[a]Permits authorized by the 1899 Act are issued by a section in the Seattle Engineer District which operates and reports independently of the recreation-resource management function. The total number of active permits in Lake Pend Oreille was not determined.

between those favoring limiting areas for docks and those favoring expansion of the area and number of facilities permitted [2,689 permits were reported (RRMS 1973) and there are conflicts between user classes].

It is significant to note that there were no reported conflicts between hunting and outdoor recreation. Also, the absence of any controls on boating (other than nominal marking of bathing areas, no-wake zones in boat harbors, and a buoy line in Mosquito Creek to separate recreation boating from a wildlife refuge) indicates the absence of serious conflict between fishermen, water skiers, and the various classes of boaters. Finally, there was no evidence of overfishing, although it was reported at Table Rock that fishing tournament pressure had made fishing less attractive than in adjacent WRDPs (Beaver and Bull Shoals).

Evidence was found to support contentions that vandalism and rowdiness are increasing because of overcrowding at Mosquito Creek, Hartwell, J. Percy Priest, Old Hickory, and Isabella. The incidence of vandalism appears to have a high direct correlation with proximity of sizeable dense urban populations.

A major cause of the overuse of the recreation lands is the inadequate quantity or quality of land available for public use. This land shortage is not always simply lack of Federal property. It can be a lack of land in the right place (Cumberland), a failure to terminate interim uses (Texoma), or constraints on public areas imposed by long term commitments to other uses (as cottage site leases at MRP #21). Inadequate facilities were found to be a prime cause of overuse at Corps recreation areas at Texoma, MRP #21,

Wappapello, Cumberland, Hartwell, Old Hickory, and Isabella.

A second major cause of overuse is the failure to control access to recreation areas. Without such control, there is no practical way to limit the number of visitors who occupy a site at a particular time or to "rest" an area as part of a rotation system to allow vegetative recovery.

A principal reason for inadequate access control is the configuration of Federal land at Corps WRDPs. Recreation areas are typically peninsulas bisected by a roadway leading to the shoreline which becomes the basis for a launching ramp and, often, a commercial marina operated by a concessioner. Campgrounds and picnic areas are frequently arrayed off the roadway near the Federal boundary, but controlling access at this point unfairly restricts other users (for example, fishermen who desire to be on the water at night or the early morning hours) and the business volume upon which the concessioner depends.

Faulty recreation area location and facility layout, most often imposed by the configuration of areas available for recreation facilities, were observed at Texoma, Pend Oreille, Jones Bluff, Table Rock, Wappapello, MRP #21, Cumberland, and Isabella. At Isabella, for example, Corps MRL is level and covered by sparse semi-arid vegetation that permits visitors to drive vehicles at random over the entire area. At MRP #21, the Corps recreation developments are in areas where mud is deposited each year. At Table Rock the combination day use/overnight recreation developments are squeezed into small peninsulas.

Additionally, unsuitable areas for intensive recreation development were found to have been selected in the absence of any geographic constraints. Such poor land selection has contributed to overuse at Isabella and Old Hickory, and could contribute to overuse at Hartwell, Table Rock, Alamo, and J. Percy Priest. Conditions which determine site suitability include slope, depth of soil mantle, erodability of soil, and characteristic vegetation. At Hartwell, the upland soils of the shorelands readily erode when exposed to precipitation; at Table Rock and J. Percy Priest the shorelands are composed of very shallow soil mantles underlain by slick-rock. In all cases, the location and design of visitor facilities should be predicated upon well identified carrying capacities. Since carrying capacity data were not available at the projects surveyed, comparisons of facility design and use with site suitability were not possible.

Another factor influencing the Corps' ability to deal with the causes of overuse is the quantity and quality of personnel at the WRDP. Shortages of project personnel appear to contribute to overuse at Jones Bluff, Pend Orielle, Table Rock, Wappapello, and Ouachita.

Directly related to the issue of staffing is the policy posture of managers with respect to limiting occupancy of facilities to design capacity. The contrast between Corps and state park policies at Table Rock and Wappapello is significant. State parks within these projects hold the number of camping parties entering the campground to the designated number of campsites. Thereafter, park personnel assist campers in locating alternative space at

public and private camping facilities in the immediate vicinity. Corps operating policy, on the other hand, permits entry of camping parties until a natural overflow occurs. When occupancy reaches 150% or more of design capacity, facilities and resources can be abused. Lack of Corps limitation of visitors significantly contributes to overuse at Pend Oreille, Texoma, Table Rock, Wappapello, MRP #21, Isabella and Ouachita.

2. Excessive Recreation Capacity

Over capacity can be divided into two categories: (1) water area that is under-utilized; and (2) facilities that are under-utilized.

Variability in the use of the surface of a body of water is a function of the configuration of the water body, the population of boats that operate on the water, and the types of boat-based activity pursued as evidenced by the types of vessels employed. For all WRDPs sampled except the Chesapeake and Delaware Canal, Colebrook, Hopkinton-Everett, and MRP #21, large, open water areas are seldom used to capacity, but local areas near marinas and concentrations of private docks in small bays and coves are heavily congested. The fact that neither the states nor the Corps have instituted water surface use controls implies that the water surface of Corps WRDPs is not now over-utilized. Problems of user distribution exist, however.

Consequences of under-utilized facilities can be: (1) diversion of public shoreland to other purposes, (2) inefficient use of scarce capital resources, (3) skewing of the work load to scarce operations and maintenance personnel,

(4) increased probability of concessioner failure, and (5) increased probability of residential development nearby. The last phenonemon was particularly noticeable at Eufaula, Robert S. Kerr, and Foster J. Sayers where recreational areas were developed to accommodate anticipated future recreation demand. The availability of large-scale, new water front facilities is an attraction that enhances sales of housing constructed in close proximity.

One cause of excessive recreational capacity is failure to even out the distribution of visitor activities on the water surface. The general configuration of a WRDP consists of a zone of open, deep water near the dam where the periodically inundated land is steep sloped and a zone of constricted, shallow water near the head of the impoundment where the land periodically inundated is relatively level. Recreation activity tends to gravitate toward the first zone. Dispersal of uniform recreation facilities along the entire shoreline is intended to encourage use of the less attractive headwater zone. To counter concentration of recreation use in the more attractive water zone, the location and design of facilities must be coupled with superior highway access, proximity to population concentrations, exceptional water quality, or uniform shoreline characteristics. When these conditions do not mesh, recreational facilities stand idle. The Eufaula WRDP illustrates the point.

A second major cause of under-utilized facilities can be traced to the little control the Corps has over the quantity, quality, or location of access roads to recreation

areas. Lack of control over the main highway arteries inhibits visitations to developed recreation facilities not served by highways. This is illustrated by Oahe, MRP #21, Ashtabula, Cumberland, J. Percy Priest, Hartwell, Eufaula, and Texoma. Insufficient access routes, compounded by poor directional signs and subdivision streets that conceal entry points to Corps recreation areas, account for underused facility capacity at Oahe, Fort Peck, Clark Hill, Old Hickory, Wappapello, Foster J. Sayers and Dworshak.

Less obvious causes of excessive recreation capacity are shifts in the nature of the communities surrounding the recreation area. For example, facilities planned in 1954 for the shoreland south of Hendersonville at Old Hickory were appropriate to then existing conditions: an agricultural setting separated from the small, clustered center of Nashville by low density suburbs. Some of the recreation areas developed with Code 712 funds were leased to local units of government who, in turn, entered into leases with private individuals for the construction and operation of commercial marina facilities. During the intervening two decades, these recreation areas were surrounded by high density suburban development. Competitive, modern marinas were built on private land separated from water's edge by as little as five horizontal feet, and recreation areas which were designed as regional facilities now serve as neighborhood parks. In spite of recreational use of approximately 10,512 visits per acre per year, the overnight and marina facilities represent excess recreational capacity.

3. Other Areas To Be Strengthened

Water that has been degraded before entering a WRDP is a cause of the decreased attractiveness of the WRDP for recreation. Introduction of pollutants into streams tributary to the WRDP constitutes a growing problem at Eufaula, Robert S. Kerr, Texoma, Ashtabula, Oahe, Jones Bluff, and Table Rock. The potential for decreasing water quality due to upstream conditions, such as mine drainage, was reported at WRDPs in the upper Cumberland River drainage (Cordell Hull). Accelerated run-off from urban development adjacent to Old Hickory was observed, and the potential for similar non-point discharges exists at Table Rock and Hartwell. Thus, deleterious impacts on the quality of WRDPs from sources external to land and water directly administered by the Corps occur, or have high probability of occurring, at 34.5% of the WRDPs surveyed.

Drawing the water surface down to lower elevations is often cited as creating extensive mud flats and other visually objectionable characteristics. At only three of WRDPs surveyed (Dworshak, Alamo, and Isabella), was this characteristic found to be an important deterrent to recreation. A more important cause of adverse consequences is the maintenance of water at levels that inundate developed recreation areas and facilities during the recreation season. Conditions at Wappapello illustrate the consequences.

The question of altering the water level regime to enhance

aesthetic and recreation values was raised at Texoma where stabilizing the pool at higher elevations would increase the recreational value of the project.[a] In all other cases, the water elevation regime as dictated by other project purposes was accepted by Corps planning and operating staffs as unalterable.

Another area in which management can be improved is related to the historical significance associated with the areas in which WRDPs are located. Historic and prehistoric travel and settlement patterns have centered on waterways, and evidence of earlier human occupancy has a high probability of remaining in areas where water resources have been developed by the Corps. In early projects, the discovery, cataloging, and interpretation of artifacts was not done.

Since the enactment of the Antiquities Act (16 USC §431-433), Corps personnel have been scrupulous in providing funds to universities, the NPS, and the Smithsonian Institution for archeological surveys and salvage. Since the enactment of the Historic Sites Act (16 USC §§461-467), and the National Environmental Policy Act (42 USC §§4331 et seq), Corps personnel have identified historic sites as well. As a result of the surveys, evidence of prehistoric activities was found at 24 WRDPs and significant historic events have been documented at or near 18 WRDPs.

Although the experience of the NPS and state park and historical agencies strongly suggests that interpretation of cultural values in the field adds to the value of a recreational experience, the Corps has not been active in this field. Where displays have been erected, they have been

[a]Oklahoma State University. 1972. Recreation Study and Assessment of Pool Elevation Effects on Recreation Visitation at Lake Texoma. Stillwater, Oklahoma.

located near the dam sites, such as at Hartwell and Oahe rather than in field locations where family recreation activities take place. In some instances, Corps activities have encouraged others to capitalize on the existing value, such as the Pennsylvania Historic and Museum Commission development at Foster J. Sayers and the erection of state historic markers at Clark Hill. The sole exception is Corps administration of the pump house associated with the history of the Chesapeake and Delaware Canal. Corps response seems adequate at the Chesapeake and Delaware Canal, Foster J. Sayers, and six other WRDPs where minimal values are reported in master plans. Thus, recreation and educational values are not being fully utilized at 72.4% of the WRDPs surveyed.

Similarly, interpretation of natural phenomena at WRDPs is generally overlooked. All Corps master plans chronical flora, fauna, and geology of project areas, but only two short nature trails represented the planned effort to explain the importance of these phenomena to the visiting public.

4. Outdoor Recreation Findings

a. Positive

(1) The 291 intensive recreation areas directly planned and managed by Corps personnel at the 29 WRDPs surveyed reported 29.5 million visitor days of use in 1973. The intensity of use ranged from 270 to 11,889 visitor days per acre per year.

(2) The water surface of Corps administered WRDPs is not being used to full capacity, but problems of localized congestion and uneven user distribution exist.

(3) Preparation of Lakeshore Management Plans is a major positive step to reconcile public interest in public land and water and the investments made by individuals as well as reduce congestion and shoreline use conflicts.

(4) Corps field personnel are generally highly motivated and perform competently and sometimes innovatively the jobs of providing safe and sanitary access to WRDPs for recreationists.

(a) The physical cleanliness and maintenance of Corps recreation facilities, particularly comfort stations, was rated excellent at 96.5% of the WRDPs.

(b) Facility use rotation, vegetative management plans, bicycle trails, and other advanced recreation management techniques were found at some WRDPs.

b. Negative

(1) There is a shortage of qualified personnel at the field level to regulate the use of resources and facilities.

(2) The planning process breaks down in one or more of the following areas:

(a) Some Corps administered recreation areas and facilities are overused (37.9% showed physical site deterioration - soil erosion) and some are underused, sometimes at the same WRDP.

(b) The location of facilities and the design of facility layout are often incompatible with the capabilities of the natural resources.

(c) Changes in the character of recreation demand are not measured over time.

(d) Planning staffs cannot adequately evaluate impacts upon recreation and fish and wildlife from various water level and release regimens.

(e) Competition or complementarity of proximate private or public recreation facilities and services are not adequately considered.

(f) Corps planning does not adequately consider increasing winter use of northern WRDPs.

(3) Other outdoor recreation problems encountered by the Corps in areas for which the agency has direct responsibility are caused principally by:

(a) Water quality problems that emanate beyond the boundaries of WRDPs.

(b) Inability to control main arterial access to WRDPs and thus to integrate various areas of the WRDP with the planning, construction, and operation of recreation facilities.

(4) Site deterioration, including soil erosion, seems to be more pronounced at older WRDPs regardless of the amount of manageable resource lands.

(a) Seventy-three percent of the WRDPs surveyed that were completed prior to 1953 displayed visible signs of site deterioration.

(b) Seventeen percent of WRDPs surveyed that were completed in 1953 or later exhibited visible signs of site deterioration.

(5) There is a shortage of land, but the shortage is not always absolute; some WRDPs lack Federal land upon which to expand recreation facilities, while at other projects

the land restraint is imposed by commitments of Corps land to other uses.

(6) The educational value of prehistoric, historic, and natural phenomena is not being fully utilized.

B. Fish and Wildlife Enhancement

The fish and wildlife potential at Corps WRDPs is composed of the fishery within the WRDP, the downstream fishery, and terrestrial and avian wildlife on project and adjacent lands. A discussion of the adequacy or inadequacy of Corps' concern for the fisheries and wildlife populations is complicated by four factors: (1) fisheries and wildlife populations are commonly evaluated as part of recreation use rather than viability of habitat; (2) the currently accepted relationship between state and Federal management of resident fish and wildlife species which is basically that Federal land management agencies are responsible for habitat management activities on lands under their control, whereas the states are responsible for actual management of resident fish and wildlife species; (3) the USF&WS is the Federal agency charged by the Fish and Wildlife Coordination Act (16 USC 661-666C) with the responsibility of assuring adequate consideration of fish and wildlife at Federal WRDPs; and (4) separating facilities and land intended to mitigate losses caused by the project from enhancement of fish and wildlife on project lands and waters.

We are concerned here with the physical aspects of fish and wildlife management at Corps administered WRDPs. Relationships with other agencies are discussed in two later sections of this chapter, Real Estate Programs and Policies, and Corps Organization.

Habitat management techniques, including some water level manipulation to enhance fish populations were found

at five WRDPs: John Day (anadromous fish runs), Oahe, Jones Bluff, Black Warrior, and Mosquito Creek. Corps district and field staffs are generally receptive to state fishery management proposals. Specific water level management to enhance waterfowl was found at John Day and Hopkinton-Everett. In some projects, for example Black Warrior and Hopkinton-Everett, timber was left standing to increase nutrients for fish. Multi-million dollar fish hatcheries have been constructed by the Corps for operation by the USF&WS, as at the Dworshak WRDP, in attempts to offset loss of cold water stream fisheries. Expensive modifications to works at John Day and the injection of oxygen into water discharged through Table Rock are examples of Corps willingness to try to moderate deleterious downstream affects of WRDPs.

Game habitat management by Corps personnel can be found at only a few WRDPs. The fact that a start has been made in the Nashville and Savannah Engineer Districts is worthy of note. Converting softwood stands to hardwood stands, establishing food plots, and building diked waterfowl areas are all part of the Clark Hill wildlife habitat enhancement program.

Now consider areas in which the Corps management of its fish and wildlife enhancement program can be improved. These principally involve: (1) water elevation fluctuations; (2) effects of downstream water releases; and (3) concern for wildlife.

1. Water Elevation Fluctuation

The artificial control of water surface elevations may have several significant effects on the Corps fish and wildlife enhancement efforts including the following: fish spawning and nursery areas and waterfowl feeding areas may be

either damaged or enhanced depending upon when the water is high or low; fishermen access may be made more or less difficult; and small game habitat may be lost when water is high. In general, the cost of maintaining fish and small game populations can be significantly increased if water levels do not allow the available habitat to be utilized fully.

Project purposes were in conflict with fish and wildlife considerations at: Wappapello, Cumberland, Ashtabula, Oahe, Fort Peck, Ouachita, Pend Oreille, Dworshak, Isabella, Hartwell, Old Hickory, John Day, Eufaula, Robert S. Kerr, Black Warrior, and Jones Bluff; 55.2% of the projects surveyed. Apparent conflicts included: inability to reduce undesirable fish and increase game fish species at Wappapello; leaving potentially valuable waterfowl habitat exposed during the fall months at Pend Oreille; and creating conditions in which native fish species cannot survive at Oahe.

The imposition of unnatural and rigid drawdown and storage schedules imposed by the legitimate requirements of other authorized WRDP purposes can adversely effect fish and wildlife populations. There is a general attitude that change of these water level regimes to favor fish and wildlife would not be consistent with the other project purposes. Such was found to be the case at Wappapello, and to a lesser extent, at Fort Peck, Oahe, and MRP #21.

Leadership in fisheries management is particularly difficult at WRDPs that extend into two or more states. At such projects as Clark Hill and Hartwell, management planning and plan implementation between the fishery personnel of the states involved is difficult. In some instances, state personnel (South Carolina) have recommended that the Corps develop and coordinate a fisheries management program for the interstate WRDPs on the Savannah River. Ten of the WRDPs surveyed (34.5%) are interstate in nature.

2. Downstream Water Releases

A WRDP structure on a natural stream changes the nature of the stream channel and the quantity and quality of water flows. In some instances, provisions were made in the design of WRDPs to permit passage of anadromous fishes (John Day), sustain minimum water flows (Everett Dam in the Hopkinton-Everett WRDP), or artificially replace lost spawning area (hatcheries at Dworshak and Table Rock). At some WRDPs, the temperature and velocity of water releases produce cold water tailrace fisheries where none existed before (Hartwell). Fish deaths downstream may also result from such things as too little water (Hartwell), or too little dissolved oxygen in the water (Table Rock).

Water releases can reduce fish populations for any of several reasons including: (1) the anaerobic condition of water released from lower elevations of the lake; (2) improper design of the release mechanisms (causing gaseous supersaturation, for example); (3) too much, too little, or surges of water released to satisfy other project purposes; (4) release of water thermally incompatible with needs of downstream biota; and (5) the incomplete understanding of biological requirements.

Problems from all these causes were found at Table Rock, Ashtabula, Fort Peck, Ouachita, Oahe, Texoma, Mosquito Creek, Hartwell, J. Percy Priest, Isabella, and John Day. Active Corps financed programs to correct the causes of fish loss are under way at Table Rock (injecting oxygen) and John Day (alteration of discharge facilities). At Ashtabula, the loss was attributable to recent floods and is not inherently a part of resource management. At the remaining WRDPs (27.6% of the sample), there are conflicts between project

purposes and downstream fish losses that deserve increased attention.

3. Insufficient Wildlife Concern

The Corps is conscientious about caring for waterfowl. The importance of grain crops as feed for waterfowl, particularly geese, is well recognized at all Corps WRDPs and no serious conflicts or problems were reported. Such is not the case, however, with upland and big game. Indications of the insufficient concern for these segments of the wildlife population include: (1) lack of conscious, planned habitat manipulation to augment game carrying capacities; (2) confusion over the responsible leadership role on land leased and/or licensed to state fish and wildlife agencies, particularly if parcels are also leased to farmers and ranchers; (3) declines in game populations and hunter success; (4) increased hunter pressure on private land.

The causes of the visible problems with game resources at Corps WRDPs are: (1) confusion over the role and level of Corps responsibility in wildlife management; (2) a general assumption by the Corps that state's rights preempt the field leaving no role for positive Corps management; (3) the shortage of trained Corps biologists at the project level; (4) poor consideration of wildlife requirements during project planning so that lands available for wildlife habitat management are too small, of the wrong kind, or poorly located; (5) program emphasis upon water-oriented recreation visitation rather than habitat management and use by hunters; (6) inadequate funding; and (7) leasing and financial arrangements that make Corps leasing for interim uses, such as agriculture and grazing, financially more beneficial to local governments

than leasing the same lands to public agencies for wildlife management.

Serious wildlife management problems were reported at 19 WRDPs (65.5% of the sample), and there is evidence that game management could be materially improved at three others. Hence, there is an indicated need for improved wildlife programs at 22 or 75.9% of sampled Corps WRDPs. Those WRDPs surveyed by CZRC which are not included in the above are: Leech and Pend Oreille (except waterfowl referred to above), which are large natural lakes with minimal Corps MRL; Hopkinton-Everett, Foster J. Sayers, Mosquito Creek, and Alamo, where all MRL has been leased to state governments; and MRP #21 where most MRL is leased to the USF&WS.

Although very diverse, the observed wildlife management problems can be attributed to the causes cited above. The specific cause at WRDPs with low MRL ratios (Table Rock, Hartwell, Old Hickory, Black Warrior) is lack of sufficient land to do more than conduct token wildlife habitat programs. In other instances, the specific causes of problems were: a lack of understanding by state personnel of the flexibility available to them to finance timber harvesting to enhance wildlife habitat (South Carolina at Clark Hill); the administration of domestic livestock use on Corps land by the BLM as agent for the USF&WS at Fort Peck; a lack of clear physical and fiscal relationships of agricultural crops and wildlife food production at Wappapello, Oahe, and Cordell Hull; livestock and big game conflicts at Ashtabula, Texoma, Eufaula, and Oahe; conflicts with forest management at Ouachita; slowness in obtaining big game land (mitigation) at Dworshak (a source of sportsmen's consternation); and pressing urbanization at J. Percy Priest. Improved management could be

achieved at Colebrook, Chesapeake and Delaware Canal, and Jones Bluff.

4. Fish and Wildlife Findings

a. Positive

(1) Corps personnel at Engineer District and WRDP levels practice limited fish and wildlife management within the WRDPs in cooperation with state and Federal fish and wildlife agencies.

(a) The water level at some WRDPs is manipulated to enhance fish nursery and waterfowl values, such as Eufaula.

(b) Peripheral vegetation is encouraged within some of the storage pools as food and cover for fish and wildlife.

(c) Release schedules and structures are modified to enhance downstream fisheries.

(d) Wildlife biologists employed at WRDPs have initiated wildlife habitat improvement programs.

(e) The Corps has issued 217 instruments outgranting 1.8 million acres of land to fish and wildlife agencies.

(2) The water bodies and shorelands of the Corps WRDP system are, for the most part, man-created environments which can be managed more intensively for fish and wildlife production than is now the case.

(a) Maintenance of constant water elevations during appropriate seasons increases the waterfowl carrying capacity at projects such as John Day; similar opportunities exist at WRDPs such as Pend Oreille.

(b) Wildlife habitat improvement programs at a few WRDPs, such as Clark Hill, are enhancing waterfowl, wild turkey, and other upland game populations.

(c) Approximately 31% of Corps WRDPs have converted downstream areas from warm-water fisheries to cold-water fisheries, the most notable example being Lake Taneycomo below Table Rock, but release of water thermally incompatible with needs of downstream biota is always possible.

b. Negative

(1) Realization of the full fish and wildlife potential of Corps WRDPs has been hampered by lack of funds, qualified personnel, and policy direction.

(a) Conflicts between water elevations presently maintained and fish and waterfowl needs occur at 55.2% of Corps WRDPs.

(b) Corps solutions to fish and waterfowl problems emphasize structural modification and mechanical manipulation rather than resolving conflicts among competing resource uses.

(c) Corps WRDP personnel have not assumed strong coordinative leadership at interstate WRDPs even when requested to do so by state agencies.

(d) Corps programs emphasize water-oriented recreation rather than habitat enhancement and hunting.

(e) Fish and wildlife enhancement receive a low priority, usually below all other Corps programs.

(2) Lake fishery and waterfowl receive more attention than stream fisheries or upland wildlife.

(a) The quantity, quality, and timing of water releases downstream deserve increased attention at 27.6% of Corps WRDPs.

(b) Responsibility for fish and wildlife management is divided between the Corps and state and other Federal agencies with no clear leadership role established.

(c) Wildlife habitat management problems and underuse of potential exists at 75.9% of Corps WRDPs. Particularly noticeable is the lack of conscious planned wildlife management programs.

(d) At some WRDPs, so little emergent land was acquired that meaningful wildlife management activities are not possible.

(3) Shortages of qualified professional personnel and funds extend to state fish and wildlife agencies that depend largely on dedicated revenue from user fees and license sales.

(a) The majority of state fish and wildlife expertise is concentrated in the headquarters staffs where one or two biologists may have responsibility for management of all state game land and fisheries programs; single district biologists often administer total fish and wildlife programs in very large areas.

(b) Increases in present dedicated revenue sources have by and large not kept pace with decreases in purchasing power and state fish and wildlife agencies are reducing programs or seeking new sources of revenue.

C. Corps and Contiguous Land Use

The use of land resources at Corps WRDPs is influenced by actions in three distinct but tightly interrelated zones of the analytic unit: (1) the shoreline, including shallow

water offshore; (2) Corps lands, particularly those lands that are seldom or never inundated; and (3) lands that are contiguous to Corps administered property. The location, size, and timing of land allocations by the Corps and investments in specific land uses influence and are influenced by the use of the shoreline. For example, Corps investment decisions in designated recreation areas at Eufaula and Black Warrior affected investment decisions by private developers. Conversely, private development decisions at Wappapello were exerting considerable access pressures to which Corps personnel felt obliged to respond.

The actual dimensions of the three zones are dependent upon variations in shoreline elevation, width of the Federally owned strip of shoreland, the location and size of Federally owned parcels, the amount of land owned by other public agencies, and the biophysical characteristics of the landscape. The case studies show a physiographic area surrounding each WRDP within which more or less direct physical cause-effect relationships exist, and a generally larger and more indistinct area where changing socioeconomic conditions have a direct bearing upon recreational use of the WRDP.

The aesthetics of scenes perceived by man are difficult to state in absolute terms because different persons derive different levels of satisfaction from the same scene. In the case of outdoor recreation, aesthetics were related to naturalness and orderliness of the scene perceived from the water surface and from access corridors leading to the WRDP.

The following discussion of Corps land and contiguous land usage is limited to the relationships that directly influence the quality of the biophysical environment at Corps WRDPs.

1. Adverse Effects of Contiguous Commercial and Residential Use of Land

Encroachments upon Federal land were reported at Hartwell, Old Hickory, Isabella, Ashtabula, Cumberland, Foster J. Sayers, Wappapello, Table Rock, John Day, Eufaula, Black Warrior, Pend Oreille, Mosquito Creek, and Texoma; 48.3% of the projects surveyed. Although the majority of MRL at Mosquito Creek and Foster J. Sayers is outgranted to state governments, encroachment remains a Corps problem. Loss of natural aesthetic appeal was observed at Texoma, Eufaula John Day, Wappapello, Ashtabula, Cumberland, Isabella, Old Hickory, Hartwell, Ouachita, and Oahe; 37.9% of the projects surveyed. Development of commercial and residential facilities adjacent to the Federal boundary was found to be sufficiently dense to block public access to Corps land and the shoreline at Hartwell, Old Hickory, Table Rock, Texoma, and Pend Oreille; 17.2% of WRDPs surveyed. Except for Texoma and Pend Oreille (a natural lake where Corps ownership and control is very limited), the consequences are limited to WRDPs with low MRL ratios. Urban runoff with attendant soil erosion and localized (often short term) degradation of water quality were reported or observed at Texoma, John Day, Eufaula, Jones Bluff, Wappapello, Old Hickory, and Hartwell; 24.1% of the WRDPs surveyed.

Other observed adverse effects of high density commercial and residential development included: overcrowding of public recreation areas and facilities; increased workload on WRDP and Engineer District staffs to accept applications from and issue permits and other outgrant instruments to private individuals authorizing them to modify shorelands or install floating facilities; and requirements for staff time to ensure the integrity of Federal property.

One of the primary causes of the adverse effects of contiguous commercial and residential use of land is inadequate Corps acquisition of key parcels of land. Control of such key parcels on some WRDPs is essential to effective management of the MRL.

Inadequate Corps land acquisition was cited as a cause of adverse effects at Oahe, Hartwell, Isabella, Old Hickory, Ashtabula, Cumberland, Table Rock, Eufaula, Black Warrior, Jones Bluff, and Pend Oreille; 37.9% of the WRDPs surveyed. Six of the seven low MRL ratio WRDPs reported inadequate land as a cause of adverse impacts on the resource units.

At Colebrook, the only low MRL WRDP without a problem, Corps ownership is coupled with Metropolitan District Commission of Hartford ownership to afford nearly complete control of the lands within the analytical unit. Similarly, there is a lack of negative impacts at the Leech Lake WRDP, where ownership and management of over 50% of the lands within the analytical unit by the USFS and the Minnesota Department of Natural Resources is coupled with state mandated zoning and building codes on private lands within one-quarter mile of the shoreline.

A second important cause of WRDP resource degradation from contiguous commercial and residential land use is the lack or inadequacy of local land use planning and development regulations and/or the lax enforcement of those that exist. This situation was found at Pend Oreille, Texoma, Mosquito Creek, Eufaula, Jones Bluff, Foster J. Sayers, MRP #21, Wappapello, Table Rock, Hartwell, Isabella, Old Hickory, Ouachita, and Oahe; 48.3% of the WRDPs in the sample. All but two of the WRDPs (Hopkinton-Everett and

Leech) do not have local land use and building regulations covering all lands abutting WRDP lands. At four other WRDPs, portions of lands abutting WRDP lands lie within urban jurisdictions with strong conventional controls, e.g., those portions of Old Hickory and J. Percy Priest within the jurisdiction of the Metropolitan Government of Nashville and Davidson County. This means that 79.3% of all WRDPs surveyed lie in jurisdictions where there are no land use controls to complement Corps management.

Opportunities for Corps project personnel to capitalize on the potential for contiguous development and to work cooperatively to control or guide development when it occurs exist to some extent at all 29 WRDPs included in the sample. This extends to coordinative and cooperative relationships with state and other Federal agencies in planning and managing contiguous lands. At all of the WRDPs where USFS lands constituted a significant portion of the analytical unit, attitudes of Corps and USFS personnel can best be described as very formal. True coordination means that both parties are willing and able to give up some things in return for gains elsewhere - an atmosphere of reciprocity.

Inadequate definition and protection of the boundaries of Corps-acquired land was found to be a cause of adverse effects at Oahe, Ouachita, Isabella, Hartwell, Old Hickory, Ashtabula, Cumberland, Table Rock, John Day, Pend Oreille, and Texoma; 37.9% of the sample.

2. Effects of Corps Development on Contiguous Land

The value of land increases with proximity to safe and sanitary access to the lakes. This increase in land value represents a portion of the land development process generally

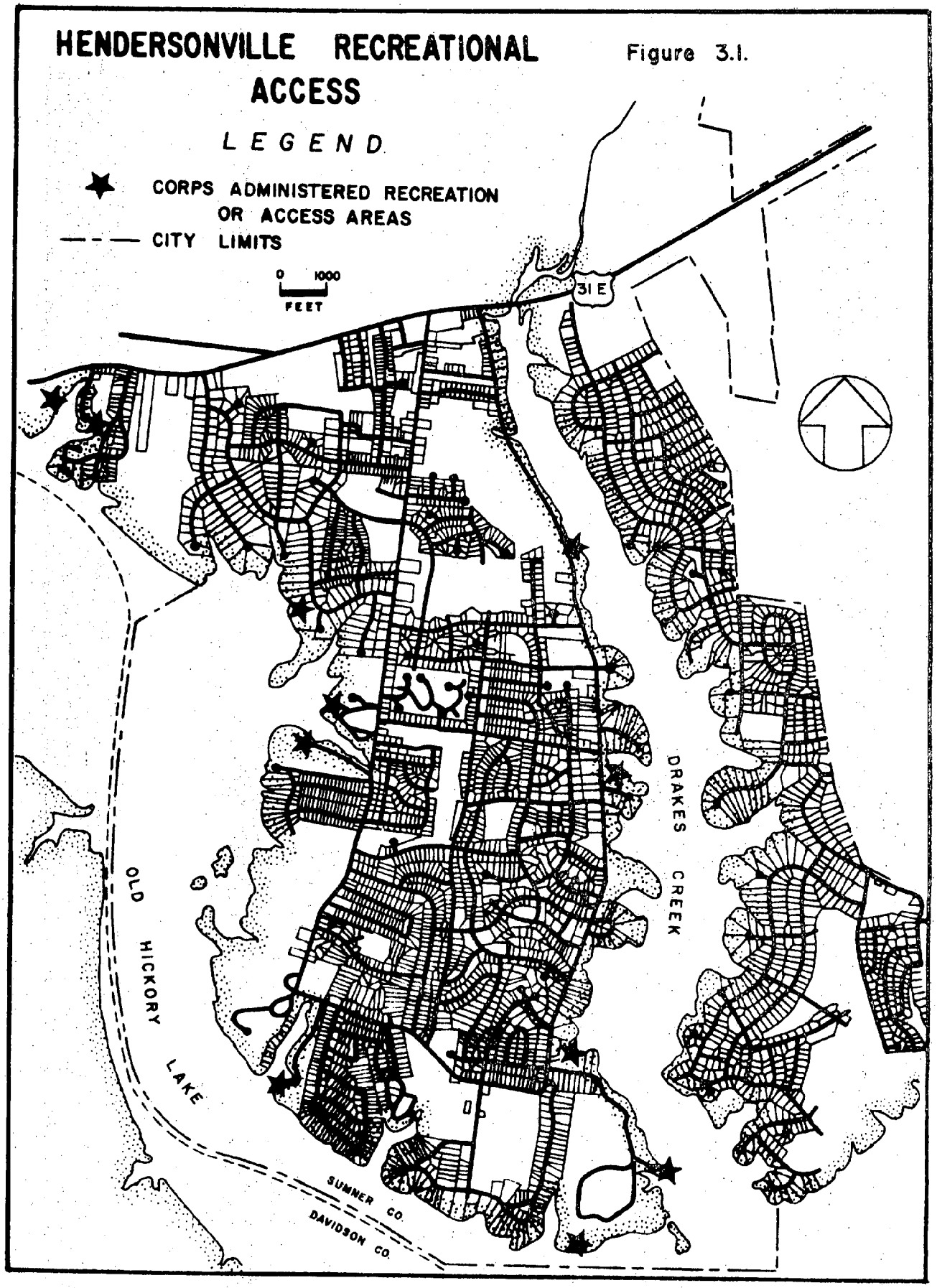
leading to the development of housing and/or commercial establishments at a rate faster than on parcels not so favored. The process quickly limits the potential for enlarging the area of public land adjacent to Corps developments.

Where WRDPs are constructed in areas exhibiting low density suburban or exurban housing patterns, Corps development decisions may alter the land use patterns to include service establishments and to change from single unit residential to either high density subdivisions, apartments, or condominiums. Corps-induced changes are most evident at Texoma, Pend Oreille, Table Rock, Wappapello, Hartwell, Cumberland, Isabella, Oahe, and Ouachita.

This process occurs in at least two stages at low MRL ratio lakes. The first increment of development occurs linearly on the strip of land immediately adjacent to Corps land, but not necessarily evenly along the entire shoreline. For example, although the portion of Old Hickory which is nearest to downtown Nashville (but outside the zoning jurisdiction of the Nashville-Davidson County Metropolitan Government) is high density suburban development, upstream housing density grades downward to exurban and rural. The second stage occurs when the accessible shoreline areas are filled; second and third tier development then radiates from places where the second and third tier homeowners can gain access to the water. The Hendersonville portion of Old Hickory may represent a third stage of development: whole peninsulas are entirely developed, (Figure 3.1) and the magnitude, pace, and location of future development is not influenced by Corps development decisions (perhaps not even by Corps lakeshore management plans).

HENDERSONVILLE RECREATIONAL ACCESS

Figure 3.1.



Middle and high MRL ratio WRDPs begin with stage two, and as at Eufaula, the sequence of development responds to the proximity of transportation arteries and the capacity of Corps development. The volume of subdivision activity at Corps projects is indicated by the data shown in Table 3-3.

Another consequence of Corps development decisions is competition between concessioners and private recreation service establishments. Concessions, whether operating under leases issued by the Corps or other agencies, offer a mix of facilities and services prescribed by the public agency; the quality and price of the goods and services offered are subject to public regulation and inspection. On the other hand, facilities operated on private land are subject only to the forces of the market, such local controls as exist, and sometimes Corps supervision of the location and quality of floating facilities installed. Thus, Corps decisions concerning the construction and operation of facilities that detract from the business of a Corps concessioner may cause business failures such as at Hartwell.

There is generally a uniform lack of analysis of the impact of Corps investment and policy decisions upon contiguous land in Corps master plans; in fact, no data were discovered at the project level that would facilitate such analyses.

Additionally, sites chosen by the Corps for development often do not have sufficient size to buffer the effects of development from contiguous lands. This characteristic was reported at Oahe, Ouachita, Isabella, Hartwell, Old Hickory, Cumberland, Ashtabula, Table Rock, Texoma, Pend Oreille, Leech, Eufaula, Robert S. Kerr, Black Warrior, and Jones Bluff. These 15 WRDPs (51.7% of the WRDPs surveyed) lacked adequate key land for recreation facility development.

Table 3-3 Summary of Known Platted Subdivision, Number of Lots, and Lots Abutting Federal Property at 29 Corps Water Resource Development Projects.

WRDP	# Platted Sub-divisions	Number of Lots	Number of Lots Abutting Corps Property
1. Wappapello	3	5,100	N/A[a]
2. Ouachita	2	2,020	N/A
3. Fort Peck	N/A	N/A	N/A
4. Oahe	N/A	N/A	110
5. Colebrook	0	0	0
6. Hopkinton-Everett	0	N/A	
7. Foster J. Sayres	N/A	N/A	N/A
8. Chesapeake & Delaware Canal	0	N/A	N/A
9. MRP #21	N/A	N/A	N/A
10. Ashtabula	N/A	N/A	100
11. Leech[b]	N/A	N/A	N/A
12. Pend Oreille[b]	N/A	N/A	N/A
13. John Day	0	0	0
14. Dworshak	N/A	N/A	N/A
15. Cordell Hull	N/A	N/A	N/A
16. Cumberland	120	N/A	N/A
17. Old Hickory	114	29,000	2,700
18. J. Percy Priest	N/A	N/A	N/A

Table 3-3 (Continued)

WRDP	# Platted Sub-divisions	Number of Lots	Number of Lots Abutting Corps Property
19. Mosquito Creek	N/A	N/A	N/A
20. Black Warrior	N/A	N/A	N/A
21. Jones Bluff	N/A	N/A	N/A
22. Clark Hill	35	N/A	598
23. Hartwell	300	N/A	2,671
24. Alamo	0	0	0
25. Isabella	N/A	N/A	N/A
26. Table Rock	284	18,534	6,721
27. Eufaula	136	N/A	N/A
28. Robert S. Kerr	N/A	N/A	N/A
29. Texoma	70	N/A	N/A
Summary	1,064	54,654	12,302

[a]Not available.

[b]Natural lake, no exterior Corps boundary.

3. Corps and Contiguous Land Use Findings

a. The interrelationship between Corps and adjacent land use has been shown significantly to effect recreation overuse and/or underuse at WRDPs.

b. Corps planning considers socioeconomic conditions in large geographic areas that influence recreation use, but does not adequately include detailed socioeconomic and land use conditions in the much smaller area -- up to 0.75 miles of the shoreline -- within which impacts are most severe.

c. Corps policies and decisions influence investment decisions within the biophysical area, and decisions by contiguous owners force responses by the Corps on the Federal lands they manage. Failure by Corps officials to recognize and act upon this relationship has resulted in:

1) Increased pressure for dock and landscaping outgrants (24.1%).

2) Loss of aesthetically pleasing approaches to WRDPs (37.9%).

3) Encroachment by adjoining landowners (55.2%).

4) Intensive development constituting a barrier to ready access to the water (17.2%).

5) Accelerated, nutrient rich runnoff from intensive contiguous development causing potential water quality degradation in the WRDP (24.1%).

d. Inadequate land in key locations is a major contributor to the adverse biophysical impacts being experienced at Corps WRDPs (37.9%).

e. There are no controls on the development process exercised by local government jurisdictions at 79.3% of the Corps WRDPs surveyed. The situation is exacerbated by the fact that only portions of four additional WRDPs are subject to stringent development controls.

f. Inadequate definition and protection of the Corps boundaries is a significant cause of encroachments in 37.9% of the WRDPs surveyed.

g. Interrelationships between concessioners on Corps land vary by WRDP and by time. Corps project personnel do not now monitor this changing relationship; thus, there is no basis upon which to adjust Corps concessioner relationships to accommodate changes in competitive position.

D. Real Estate Programs and Practices

From the standpoint of recreation, fish and wildlife enhancement, and land use, Real Estate Directorate (RED) personnel function in six areas: (1) as a repository for all land titles; (2) issuing easements, licenses, and permits to agencies and individuals for rights-of-way across Federal land; (3) issuing leases and licenses to public agencies for public recreation and for fish and wildlife enhancement; (4) issuing leases to quasi-public agencies for the use of Federal lands and the development of group recreation facilities; (5) issuing leases and licenses to private individuals for a variety of activities on Federal land, including private cottages, commercial concessions, cultivation of row crops, and grazing; and (6) supervising the sale of products, such as timber, from civil and military property.

In each of the areas, RED personnel are charged with assuring the integrity of the land entrusted to the Corps, including: resolution of encroachment upon Federal property and trespass; imposition of special terms designed to protect and enhance the Federal lands and inspection to assure compliance by grantees with the special and general terms of outgrant instruments; and periodic calculation of fair and equitable amounts due the U. S. from the grants of use privileges.

Successful accomplishment of these tasks requires skills in real estate law and practice, business administration (particularly marina and food and lodging management), land management, and public affairs.

In fulfilling their responsibilities, RED personnel are constrained by: (1) conditions imposed in the project authorization, such as the recognition of existing utility rights-of-way, rights of first refusal and/or rights attached to the acquisition of the property, such as the right of livestock to cross Federal land to water; (2) master plan designation of areas for intensive recreation development, interim uses, and wildlife management; (3) acceptance by state and local governments of national policies for assuming development, operating, and maintenance costs; and (4) the effectiveness of project-level Corps organizations.

The RED staff at the field level can dominate recreation and resource administration, or they can be only a service unit subsidiary to the planning and/or operations functions. Some of the problems in the real estate area cannot be attributed solely to the real estate staffs. These problems are the result of joint decisions made with personnel in other substantive divisions.

In this part of the study, the effectiveness of the Corps' real estate programs and policies with respect to recreation, fish and wildlife enhancement are dealt with. First, examples of good management practices are cited, followed by a discussion of problem areas in which improvements could profitably be made.

First consider examples of the strong points in the programs and policies. Corps real estate practices represent very high standards. There is open competitive bidding for concession privileges, full disclosure of negotiations for agricultural and grazing leases, and use of a base fixed fee plus graduated percentage of gross income to compute concessioner rents. All these practices are recognized by public agencies such as the Office of Management and Budget as fair and equitable ways to grant private use of public land while protecting the national interest.

Now consider areas in which the Corps' real estate practices can be improved with respect to its recreation, fish and wildlife enhancement efforts. These areas principally involve: (1) instrument conditions and enforcement; (2) inadequately defined and/or unprotected boundaries; (3) concession practices; (4) interim land uses; (5) reliance on state and local governments; and (6) use of other Federal Resource Management Agencies.

1. Instrument Conditions and Enforcement

Instrument and enforcement deficiencies generally lead to poor use or overuse of land resources. Overgrazing and poor agricultural practices, for example, evidenced by exposed soils and accelerated erosion, were reported at Ouachita, Fort Peck, Oahe, Isabella, Ashtabula, Wappapello, Texoma, John Day, and Eufaula; 31.0% of the projects sampled.

Instrument and enforcement deficiencies also generally lead to the presence of poorly operated and maintained concession areas. The evidence most often found was run-down buildings, house trailers used as rental units scattered about a concession area, and the presence of abandoned vehicles, appliances, and other debris.[a] Poor concessioner compliance with the maintenance provisions of Corps lease instruments was noted at Leech, Cumberland, Hartwell, and Old Hickory, or 13.8% of the sample.

There is a lack either of realistic grantee investment schedules in the terms of the outgrant or of evidence that existing schedules are being met at Isabella, Pend Oreille, Dworshak, Hopkinton-Everett, and Eufaula, or 17.2% of the WRDPs sampled. More serious is the lack of an accounting of cumulative investments in recreation and fish and wildlife made by non-Corps entities. At all WRDPs except Colebrook (where there are no outgrants) and Cumberland, records of the cumulative total of investment per lessee and forecasts of planned lessee investment are incomplete. At the WRDPs where the records and forecasts are incomplete, their existence in any form seems to be more nearly attributable to the initiative of the lessee [an example is the forecast of planned investment by the Quincy (Illinois) Park District (MRP #21)] than to Corps management of the lessees.

Enforcement deficiencies lead to after-the-fact discovery of encroachments and trespass. Encroachments are evident at John Day, Eufaula, Black Warrior, Jones Bluff, Pend Oreille, Texoma, Table Rock, Wappapello, Ashtabula, Cumberland, Isabella, Hartwell, Old Hickory, Ouachita, Oahe,

[a]Special care was taken not to include in this enumeration those facilities built upon private land adjacent to a Corps boundary but operated as part of an area covered by Corps lease or Title 36 permit.

and Fort Peck; 55.2% of the WRDPs surveyed. Lack of interest in field inspection and enforcement activities by RED and lack of RED professional staff at field locations from which frequent, irregular observations of conditions could originate were reported at Black Warrior, Jones Bluff, Pend Oreille, Chesapeake and Delaware Canal, Wappapello, MRP #21, Foster J. Sayers, Ashtabula, Leech, Isabella, Oahe, and Fort Peck; 41.4% of the surveyed WRDPs.

In one field, wildlife enhancement, RED personnel have difficulty in identifying adverse effects of poor land management practices. Wildlife outgrants (leases and licenses) are made to state and Federal agencies with biological expertise. RED officials do not have the necessary expertise to judge the adequacy of proposed state or Federal investments and operating and maintenance schedules. Further, compliance with schedules that are submitted is difficult to enforce.

Part of the problem in the wildlife enhancement field is the incomplete understanding by state lessees of the financial alternatives open to them for managing habitat on WRDP land. For example, top South Carolina Wildlife and Marine Resources Department staff were uncertain as to the extent departmental personnel could mark and cause to be sold standing timber on land leased from the Corps at Clark Hill. The lease provides that such proposals be made as part of the state's annual work program that is reviewed by the Corps for technical competency and that receipts from the sale be earmarked for further improvement of the leasehold.

The degree of RED reliance upon project level personnel is conditioned by the quality of the field force. In the South Carolina case cited above, project level professional

staff can relate habitat management on Corps land to state management proposals; at other projects, there are no professional personnel other than the district environmental resources staff on whom RED can call for assistance. Under these circumstances, it is difficult to obtain flexibility in balancing the technical language of the instruments against pragmatic field relationships within the context of legal and policy requirements.

A well recognized cause of encroachment and trespass is the absence of well marked boundaries on the land outgranted. In some cases, this situation is synonymous with failure to mark clearly the limit of intensive recreation areas where special visitor regulation authorities apply. In these cases, RED responsibilities can be coordinated with Corps field personnel, especially the growing ranger force. Mutual confidence may require frequent RED/Recreation-Resource Management coordinating sessions to assure joint familiarity with conditions in the field and with RED requirements.

A principal cause of the problems associated with instrument conditions and enforcement is the lack of direct involvement by project level personnel in the formulation of the conditions to be attached to outgrant instruments and the very uneven division of responsibility between RED personnel and Operations Division personnel stationed at or assigned to the WRDPs. In some instances, project personnel warn concessioners of unsatisfactory conditions only to see RED inspectors ignore their recommendations to penalize repeat offenders; in some cases, outgrant inspections are made by RED only once per year. Such conditions were found to exist at Ouachita, Fort Peck, Oahe, Isabella, Ashtabula, MRP #21, Pend Oreille, and Texoma; 27.6% of the sample.

2. Inadequately Defined and Unprotected Boundaries

The incidence of management problems related to inadequate boundary location and marking is identical to that associated with contiguous land use. There are, however, different considerations more directly related to RED activities.

Lack of clearly marked boundaries makes prosecution of violators difficult. Examples of inability to prove trespass violations were found at Ouachita, Oahe, Isabella, Old Hickory, Hartwell, Ashtabula, Cumberland, Table Rock, and Pend Oreille; 27.5% of the WRDPs surveyed. Frequent grazing, timber, and wildlife trespass is another problem. The cause-effect relationship between trespass frequency and boundary definition is not clear. Rustling is a national phenomenon; felling mature walnut trees is a function of the market value of a highly demanded material in short supply. Frequent abuses and unsuccessful prosecutions were reported at Texoma, MRP #21, Wappapello, Ouachita, Oahe, and Fort Peck; 21.6% of the projects in the sample.

The causes of this situation mainly stem from the low priority assigned to boundary problems, such as was reported at Ouachita, Oahe, Fort Peck, Hartwell, Old Hickory, Ashtabula, Table Rock, Foster J. Sayers, Wappapello, MRP #21, John Day, Eufaula, Robert S. Kerr, Black Warrior, and Jones Bluff; 51.7% of the projects studied. Low priority means too few personnel in the field and a reluctance to prosecute encroachment and trespass cases vigorously. Some evidence of this exists in the level of staffing of RED Management and Disposal Branches (or its equivalent) at the district level. Lack of vigorous enforcement is indicated when resolution of encroachment cases consists of the sale or lease of the property encroached upon to the offender (four such sales and three such leases reported in one year at a single WRDP).

3. Concession Practices

The 29 case studies include 117 concessioners operating under leases issued by the Corps. Two of the leases were for terms exceeding 25 years, 78 were for terms of 16 to 25 years, 17 were for terms of 6 to 15 years, and 20 were for terms of 1 to 5 years.

The basis upon which annual rent is paid varies widely. District RED personnel are converting to the system of minimum fixed fee plus a graduated scale based upon the relationship of gross income to investment. The rate at which this conversion is occurring also varies widely. Some districts are renegotiating leases on their initiative while other districts wait for the termination of the present lease or a request by the lessee for major modifications. During 1973, 47 leases specified a fixed annual rental, 37 were based upon a small fixed minimum rental plus a percentage of gross income, and 33 specified the graduated system.

Analysis of the characteristics of the 117 concessions, shown in Table 3-4, reveals that the term of lease is relatively short. In an earlier study[a], concessioners indicated that uncertainties of project operations beyond the control of concessioner, requirements to remove all facilities on 30 day notice if the land is to be converted from recreation to other project purposes, and inability to secure capital at reasonable cost when tenure is less than 50 years all contribute to limited concessioner investment in recreation facilities. In this regard, the existence of run-down or substandard facilities was noted at Oahe, Hartwell, Old Hickory, Leech, Eufaula, Cumberland, and Isabella; 21.6% of the projects surveyed.

[a]Coastal Zone Resources Corporation. 1973. The Private Sector and Cost-Sharing Recreation Development and Maintenance at Corps of Engineers Multi-Purpose Projects: An Initial Inquiry. Office, Chief of Engineers, Washington, D. C.

Table 3-4. Characteristics of Concession Leases at 29 Corps Water Resource Development Projects.

WRDP	Number of Concessioners	Length of Lease (yrs)				Terms			Annual Rent Paid $
		1-5	6-15	16-25	25+	Fixed	% Gross	Graduated	
Wappapello	11	5	3	3		10	1		4,010
Ouachita	9			9		1	8		17,803
Fort Peck	2			2		2			635
Oahe	4	3		1		3		1	1,025
Colebrook	0								
Hopkinton-Everett	0								
Foster J. Sayres	0[a]								
Chesapeake & Delaware	0								
MRP #21	0								
Ashtabula	2[b]	2				2			294
Leech	6	6				6			1,300
Pend Oreille	0								
John Day	0								
Dworshak	0								
Cordell Hull	3			3				3	N/A[g]
Cumberland	9[a]		1	8				9	49,567
Old Hickory	12[c]		1	11		10		2	8,910
J. Percy Priest	4			4			2	2	19,816

Table 3-4. (Continued)

WRDP	Number of Concessioners	Length of Lease (yrs) 1-5	6-15	16-25	25+	Terms Fixed	% Gross	Graduated	Annual Rent Paid $
Mosquito Creek	0[a]								
Black Warrior	0								
Jones Bluff	0								
Clark Hill	4[d]			4				4	5,323
Hartwell	6[e]	1		3	2	2	4		5,445
Alamo	0								
Isabella	3		3				1[f]	2	6,522
Table Rock	13	1	1	11		6	7		16,172
Eufaula	4	1	1	2		2		2	6,414
Robert S. Kerr	1			1				1	652
Texoma	24	1	7	16		3	14	7	35,650
Totals	117	20	17	78	2	47	37	33	179,538

[a]There are third party concessioners operating in addition to Corps.

[b]One reported business failure.

[c]Includes one third party lease assumed by Corps.

[d]One facility had 5 turnovers in 20 yrs; one had 4 turnovers in 20 yrs.

[e]Had three operations that changed ownership three times in the first 5 yrs.

[f]% of gross only.

[g]Not available.

Survey team observation of concessions revealed that with few exceptions concession operations are primarily marinas and fish camps that vary only in scale. This situation contrasts with resort type facilities found on private land contiguous to low MRL ratio WRDPs, such as Table Rock, which only require passage across a narrow strip of Corps land and a permit for floating facilities. Hence, the full potential range of visitor demands for fishing, boating, and other family activities which could be offered by Corps WRDPs is limited basically to water related activities.

A corollary problem is the concession failure or turnover. Definitive measures of the turnover rate are not available for a variety of reasons. An operator may assign his interest in a lease and facilities to another party with approval of the District Engineer. There is no easy way to determine whether such assignment is made because of financial difficulties or because of speculation. In addition, although a large number of lease amendments record internal reorganization of lessees, it is not possible to tell whether the reorganization was caused by a need to save an operation by infusing new capital or the emergence of a dominant individual in a viable operation. Thirdly, turnovers may be caused by Corps operation of WRDP water levels rather than private investment or the management capability of the operator.

A cause of poor concessioner selection is inadequate market information upon which to base the content and timing of a concession prospectus. Forecasting recreation visitation accurately is difficult, particularly in view of the variety of purposes to be served by Corps project forecasts. Planning staff forecasts during the preauthorization period and the

degree of subsequent forecast refinement depend upon whether recreation is intended as an authorized purpose for which benefits must be calculated as directed by Supplement 1, Senate Document 97, or whether only an estimate of the cost of minimum basic facilities is needed. Other forecasts are made during the post-authorization master planning process in order to determine facility needs. The methodology for this process, devised by the Sacramento Engineer District for the Office, Chief of Engineers, is a useful guide for determining service areas and capacities needed[a]. In no case, however, do forecasts isolate the competitive and/or complementary relationships between different levels of public investments and private investments. Distinctions are not made between gross visitation and visitors who will contribute to the cash flow of a concessioner

Finally, although not quantifiable, there was a feeling in some districts that persons with the prerequisites for a good Corps concessioner are hard to find and, therefore, every consideration should be given to existing operators to prevent a lease cancellation and a vacant concession operation.

4. Interim Uses of Land

Land acquired as part of WRDPs may be allocated only for authorized uses. Where recreation and fish and wildlife enhancement are recognized as project purposes, allocations of land for these purposes may be made. During the transition from land use patterns existing at the time of WRDP authorization and full operation of the project, lands not immediately needed for project operations, recreation development,

[a]Sacramento District. 1969. Estimating Initial Reservoir Recreation Use. Sacramento, California.

or habitat improvement can be used for other purposes, most often agriculture and grazing practiced by owners and/or operators of adjacent land. The Corps designates such use of a WRDP as "interim" and issues short-term leases (usually 5 years or less) to private individuals permitting the planting and harvesting of crops and grazing of livestock.

In theory the system permits productive use of land until a higher public demand develops. In practice, however, the interim use tends to become permanent. The lessees become accustomed to using the land and oppose even general policy moves to limit private use (Wappapello); some request permission to post the land to prevent entry by sportsmen (Hopkinton-Everett). Efforts by the Corps to encourage good husbandry increases the possessory feeling. For example, when the Corps included application of fertilizer, seed, and fencing as lease conditions (Hopkinton-Everett and Clark Hill), the concomitant investment was considered as securing a right to the use of the land that should not be abrogated. Reduction of this lease program is also resisted by local governments who receive 75% of the lease income received by the Corps. At Fort Peck and Wappapello, the short-term, interim leases have been repeatedly renewed to the same individuals or their assigns for thirty or more years.

In cases such as Wappapello and Hopkinton-Everett, where MRL is in large part level flood plain, subject to only infrequent inundation and surrounded by steep, rocky slopes and ridges, maintenance of open pasture and the growing of grains may be beneficial to upland wildlife. If the same land were leased to a wildlife management agency, similar agricultural practices probably would be prescribed (as was found at Oahe by the North Dakota Department of Fish and Game and at MRP #21 by the USF&WS), and there would be no lease income to dis-

tribute to the counties, since the lease income accrues to the managing agency.

The situation becomes more sensitive when grazing of open range land is involved. Such cases often result in direct competition between livestock and big game animals (Texoma, Eufaula, and Fort Peck).

The Corps finds itself between opposing forces with very little internal expertise available. This observed lack of professional expertise is corroborated by the following: (1) specific land treatment provisions included in the Hopkinton-Everett and Clark Hill cases are the exception rather than the rule, (2) good husbandry is recommended by general reference to conservation districts and the cooperating U. S. Soil Conservation Service, and (3) no lease instruments examined in this study expressed pasturage or grazing in animal unit months (AUM) at specific times of the year.

5. Reliance on State and Local Governments

The intent of Congress to encourage state and local governments to develop and operate public parks has been implemented by the Corps. Five hundred nineteen thousand acres of Corps land have been outgranted to states, counties, municipalities, and other local public bodies for public recreation purposes.

In addition, state governments who desire and are able to assume management responsibilities for all MRL in a project have been encouraged to do so as in the cases of Mosquito Creek, Hopkinton-Everett, Foster J. Sayers, and Alamo; 13.7% of the WRDPs surveyed. The Congressional intent has been to provide basic minimum safe and sanitary access to the water

resource at Federal expense; more sophisticated facilities, such as full-service campgrounds and lodges, are to be provided at non-Federal expense. The states have taken advantage of the opportunities offered, as exemplified by Cumberland State Park (Kentucky), Lake Texoma State Park (Oklahoma), and the Baker Creek State Park (South Carolina) under development at Clark Hill. Complexes such as these (with lodges, cottages, golf courses, and air strips as well as more conventional campgrounds and marinas) constitute a new type of state operation: the resort state park.

The following are some state characteristics discernible from the WRDPs studied by CZRC and from other studies. (1) Once a state commits itself to the long-term (50 years) administration of Federal land, it honors the commitment; there were no reported attempts by the states to abrogate existing leases on the Corps WRDPs surveyed. (2) State natural resource departments are more interested and able to accept management of all project MRL than single purpose state agencies. The Ohio (Mosquito Creek) Department of Natural Resources exemplifies the point. Relations with Corps personnel are better because inter-functional disputes are internalized. Where consortia of state agencies are involved, as in the case in New Hampshire (Hopkinton-Everett) and Arizona (Alamo) coordination may become a problem. (3) There seems to be an upper limit on WRDP size and total WRDP acreage that state agencies are able to handle financially. Most state parks do not meet their operations and maintenance cost from income, let alone accumulate reserves equal to depreciation.[a]

[a]States that finance capital improvements with proceeds from the sale of revenue bonds may be an exception. Here, as in

The 22,856 acre outgrant to Arizona at Alamo is equal to the total project acreage reported in RRMS 1973, and is the largest single project of this type managed by state government. Even the size of this project as an upper limit is mitigated against by the relatively small size of the recreation water body (11,000 acres), relative distance from population centers, and the fact that the capital cost of initial facility development was borne by the Corps.

The success of the outgrant policy with respect to local governments is mixed. At the 29 WRDPs surveyed, 50 recreation areas presently managed by the Corps were originally designed and developed for operation by local governments[a]; 11.1% of all Corps operated recreation areas in the sample WRDPs. The full cost of developing these facilities was paid by the Corps from project or Code 710 funds.

The complexity of Corps resumption of management is increased when a third party concessioner has invested in facilities and, in some cases, acts as park manager for the local government. The common Corps practice observed in the

---

the case of Kentucky, park operations must be profitable (Robert R. Nathan and Resource Planning Assoc. 1967), but in the process non-revenue generating facilities, such as sand beaches, are often neglected in favor of facilities that do generate income, such as lodge swimming pools.

[a]The total of 50 represents known areas where management has reverted to the Corps. The point was not pushed in early field work and some reversions may have been missed. Nashville Engineer District personnel reported that at least two other recreation areas outgranted to local governments were likely to revert to the Corps.

study was to honor existing lease agreements between local agencies and concessioners.

Sparsely populated, rural jurisdictions are most prone to request cancellation of leases in favor of Corps management (Table 3-5). In the Mosquito Creek and Hopkinton-Everett cases, the state leases contemplated third party arrangements with a local government. When local participation did not materialize, the areas were dropped from the state lease and management was assumed by the Corps. At Old Hickory, lease cancellations were requested by public utility districts and suburbanizing government jurisdictions but not the Parks and Recreation Department of Nashville-Davidson County Metropolitan Government. One reason for these changes may be that there is seldom a staffed park and recreation agency within the lessee jurisdiction. There is no established commitment to recreation services for residents by the legislative body of the jurisdiction and operating a recreation area at a Corps WRDP is the first venture of the government into recreation administration. Thus, when the composition of the legislative body changes, there is no accepted voice to advocate appropriations to continue operating one or two recreation areas that may, in fact, be little used by a rural constituency. Their needs may be well met by the free, minimum basic access the Corps is required by law to provide. This general pattern does not apply universally. At Isabella, all recreation areas were once managed by Kern County, California, which has a well developed county park and recreation department and a broadly based county budget; nevertheless, these areas have also reverted to Corps management.

Table 3-5. Recreation Areas Developed for Operation by Local Governments Now Operated by Corps.

Project	Number of Areas
Hopkinton-Everett	3
Ashtabula	7
Pend Oreille	2
John Day	8
Old Hickory	4
Mosquito Creek	1
Isabella	13
Table Rock	12
Totals 8	50

A quantitative analysis of municipal park performance was not possible. It did seem, however, that the proximity of a town or city to the recreation pool at 10 WRDPs is a major reason why the 17 municipal public park lessees have continued to manage their recreation areas. Data presented in Table 3-6 show the number and acreage of municipal park outgrants at the 29 WRDPs studied.

State and local response to the retroactively applied cost sharing principles of the Federal Water Project Recreation Act (PL 89-72) to Code 710 funds are low. Within the sample studied, only the State of Arkansas and Montgomery County, Arkansas (Ouachita), the State of Texas (Texoma), the State of Arizona (Alamo), and the State of New Hampshire (Hopkinton-Everett) had expressed interest in the program, and are the only WRDPs where an active non-Federal interest was reported. No cost sharing concepts had been executed.

This information is confirmed by a report on Code 710 contract status compiled by OCE as of 2 May 1974 (Table 3-7). Twelve states, 16 cities, and only 7 counties expressed interest in the programs. Again, the preponderance of non-state interest came from urban jurisdictions.

6. Use of Other Federal Resource Management Agencies

Some of the recreation-resource management load at Corps WRDPs has been assumed by other Federal agencies. As shown in Chapter 1 (Table 1-7), 378,028 acres in the Corps WRDP system is outgranted to USF&WS for management as parts of the national wildlife refuge system.[a] In a Memorandum of Understanding between the Secretary of Agriculture and Secretary of the Army, originally executed in 1964 and subsequently amended, the Corps

[a] Management for that part of Charles H. Russell National Game Range withdrawn for the Fort Peck WRDP is shared by USF&WS and BLM, according to Corps outgrant documents.

and USFS recognize a community of interest in those WRDPs that are or may be created within or adjacent to the boundaries of the national forest system. The Agreement between the agencies recognizes that Corps WRDPs are or may be built so that a majority or all of the shoreline consists or may consist of land held by the United States and entrusted to USFS administration; Corps WRDPs are or may be built within National Forest boundaries, but where a majority or all of the MRL has been or may be acquired for the United States by the Corps with project funds; and Corps WRDPs are or may be built adjacent to National Forest boundaries. In the first situation, USFS continues multiple use management of the land; assumption of the additional recreation work load caused by the WRDP (including project financed facilities) can be accomplished by only adding direct recreation employees since District Ranger and Forest Supervisor staffs are already in place. In the latter two situations, USFS assumption of recreation-resource management of all or part of Corps acquired MRL is judged upon the relative efficiency of using in-place agency management staffs. Wherever possible, management is outgranted to USFS. Operations under the Memorandum of Understanding (formalized as a Corps Engineering Regulation) recognizes the urgency of applying skilled management to WRDP lands and achieves economies through efficient use of available manpower.

7. Real Estate Programs and Practices Findings

a. Positive

(1) Real Estate Directorate personnel are competent professional realty specialists, interested in their work and well equipped to support recreation-resource management programs.

(2) The organization of the real estate function at the Engineer District level is very uniform, sometimes overly so.

Table 3-6. Municipal Outgrants for Public Parks.

WRDP	Number of Outgrants	Acres	Term
Oahe	3	137.7	25
Foster J. Sayres	2	45.5	25
C & D Canal	1	1.5	25
MRP #21	1	35.5	25
John Day	2	75.6	25
Cordell Hull	1	116.0[a]	20
Old Hickory	2	71.0	2-25
Clark Hill	1	60.0	25
Hartwell	1	28.0	25
Texoma	3	462.0	10-25
Totals 10	17	1032.8	--

[a]For use of the Town of Gainsboro as part of a municipal golf course.

Table 3-7. Nationwide Corps Code 710 Cost Sharing Response.[a]

WRDP/Recreation Area	Sponsor
Ouachita	
3 Sisters Park	State of Arkansas
South Twin Creek	Montgomery County
Sakakawea	
Four Bears	3 Tribal Councils
Hazen	City of Hazen
Little Muddy Creek	City of Williston & Williams County
Mountrail	Mountrail County
AIWW	City of Chesapeake
Waterbury Lake	State of Vermont
Hopkinton-Everett	State of New Hampshire
Tully	Commonwealth of Massachusetts
Fall Creek	
Sky Camp	School District
McNary	
Columbia	Benton County
Gen. Groves	City of Richland
West Fork Mill Cr.	Hamilton County
Atwood Lake	Muskingtum Conservative District
Greenup Lake	City of Huntington
Dillon Lake	State of Ohio
Berlin Lake	State of Ohio
Belleville	City of Parkersburg
Bluestone Lake	State of W. Virginia
Center Hill	State of Tennessee
J. Percy Priest	City of Nashville
Dale Hollow	
Dale Hollow St. Pk.	State of Kentucky
Standing Stone	State of Tennessee
Lake Barkley	State of Kentucky
Cheatham	City of Nashville
Wolf Creek	State of Kentucky

Table 3-7. (Continued)

WRDP/Recreation Area	Sponsor
Allatoona	
Acworth Sub Impoundment	City of Acworth
Red Top Mt. State Park	
Lake Sidney Lanier	Lake Lanier Islands Authority
John H. Kerr	State of North Carolina
Jemez Canyon	City of Albuquerque
Grapevine Lake	City of Grapevine
Somerville Lake	State of Texas
Whitney Lake	State of Texas
Nimrod Lake	City of Plainview
Bull Shoals	
Shadow Rock Park	City of Forsyth
Bull Shoals St. Pk.	State of Arkansas
Dardanelle	State of Arkansas
Millwood	State of Arkansas
Lake Texoma	State of Texas
Alamo Lake	State of Arizona
Carbon Canyon	Orange County
Fullerton Dam	Orange County
Hanson Dam	City of Los Angeles
Prado Dam	City of Corona & Riverside County
Whittier Narrows	City of Pico Rivera & Los Angeles County

[a] Corps of Engineers, Office, Chief of Engineers, Disposition Form, Status Report - Recreation Cost Sharing Contracts. Washington, D. C. 20 May 1974.

(a) Instrument format, record keeping, and organization of branches and sections are nearly identical in all Engineer Districts visited, except those in the North Central Engineer Division.

(b) The practices followed, e.g., establishment of fees and awarding of outgrants, are recognized by cognizant authorities as being well suited to the task of encouraging private use of Corps resources while protecting the public interest.

(3) Most management and disposal branch personnel take a direct interest in the successful operation of recreation facilities at WRDPs, especially meeting the unusual problems faced by concessioners.

(4) WRDP land, including recreation facilities built with project and Code 710 funds, have been made available to state governments and their political subdivisions; in many cases non-Federal public bodies have been encouraged to develop and manage WRDP land for recreation and fish and wildlife under the outgrant program.

(a) Nationally, 473,826 acres are leased to the states for public park purposes; 45,473 acres are leased to political subdivisions for public recreation.

(b) In some cases, entire project areas are outgranted to one or more state agencies, but there seems to be a maximum size -- the largest WRDP totally outgranted is 24,000 acres -- beyond which states will not assume management responsibility.

b. Negative

(1) Some Engineer District Real Estate Directorate (RED) personnel interpret their custodial responsibility to encompass areas in which they lack professional expertise and operational capability.

(a) In the absence of forceful recreation-resources management leadership, RED personnel may take a policy making posture in recreation affairs.

(b) Inadequate coordination between RED personnel and WRDP staffs intensifies encroachment and trespass problems and permits poor operations and maintenance by concessioners.

(c) In only rare occasions do RED personnel remain at the WRDPs once all parcels are acquired.

(2) Planning and management provisions in Corps lease documents are perfunctory paragraphs bearing little relationship to specific development needs or necessary management practices, providing little opportunity to match lessee performance against master plan objectives, and making enforcement difficult.

(3) The low level of private concession activity is reflected in relatively low total capital invested, a limited range of facilities built on Corps land, low annual rent payments, and a lack of concession specialists on RED Engineer District staffs.

(a) Only $13.1 million was invested by private concessioners at the 29 WRDPs surveyed.

(b) Facilities provided by concessioners are largely marinas and fish camps. Total rent paid by concessioners in 1973 was $179,418.

(c) No RED personnel specializing in concession management were identified in the 19 Engineer Districts visited.

(4) Administration of agriculture and grazing outgrants as interim uses poses problems in achieving the full wildlife potential of WRDPs.

(a) Responsibility for agriculture and grazing use is divided among planning, recreation-resources management, and the management and disposal element of RED.

(b) There are 542,700 acres outgranted for agriculture and 603,550 acres outgranted for grazing use nation-wide.

(c) Conflicts with wildlife occur when the cropping pattern is not coordinated with wildlife interests and when grazing animals compete directly with big game animals for available forage.

(d) Such interim uses have become institutionalized by continued reissuance of leases and by the nature of the formula distributing Corps lease income to local governments.

(5) The Corps is assuming an increasing role, and local governments a decreasing role, in operating recreation areas at WRDPs.

(a) Reversion of outgranted recreation areas, even when developed at Federal expense, is increasing, particularly when rural governments are involved.

(b) In some instances, local governments refuse to accept responsibility for operating and maintaining such developed areas in the first place.

(c) This trend will probably continue, particularly with retroactive application of cost sharing.

(6) USFS administration of Corps WRDPs under the Memorandum of Agreement reflects the agency philosophy toward recreation development which will be enlarged upon in Chapter 4.

E. Corps Organization

The case studies considered in our study show water and land environments have been under Corps control for as long as 80 years. Until recently, their potential as recreation, fish and wildlife resources was recognized by a relatively small number of persons scattered among Engineer District and Division offices, OCE, and the Board of Engineers for Rivers and Harbors. These individuals, through personal interest or training, actively promoted development of the recreation and fish and wildlife potential of existing and planned WRDPs and created the climate for professional consideration of these matters that endures to this day. Their personal imprint extends beyond simple recognition of importance to philosophies of management. A senior Corps civil servant with a NPS background emphasized resource protection (Savannah); another with an outdoor recreation background emphasized facility development and people management (Nashville).

The wave of public participation in, and concern for, outdoor activities of the 1950's and 1960's broke upon this emerging framework. At the same time, the backlog of authorized WRDPs built up during the 1940's was funded and district engineering and construction staffs expanded accordingly.

As national attention increasingly highlighted outdoor recreation and natural beauty, OCE sought to improve the outdoor utility of WRDPs and to emphasize the significance of existing WRDPs in state and regional outdoor recreation, land use, and environmental planning. A report to the Chief of Engineers examined these issues and recommended separating the recreation planning function from engineering and relocating

it in the planning division in the Civil Works Directorate[a]. A planning division assignment was made in OCE and the Engineer Divisions quickly followed suit. By fall, 1974, however, only 4 of the 19 engineer districts visited had established planning divisions (Table 3-8). Recreation planning, environmental resources, and master planning branches or sections are found in a wide array of configurations within the planning and engineering divisions.

Rapidly increasing outdoor recreation use of Corps WRDPs and the impact of the Water Resource Project Recreation Act (PL 89-72) upon Corps policies and practices prompted the Chief of Engineers further to investigate ways to meet public recreation needs. A report written by Edward C. Crafts placed considerable emphasis upon professional personnel and program modifications.[b] Shortly thereafter (1971), a recreation-resources management branch was established within the construction-operations division of OCE. Of the 19 Engineer Districts visited, all but three had established a comparable branch or section in the operations division.

A series of Engineer Regulations (e.g., ER 1110-2-400, ER 1120-2-400, ER 1120-2-401, ER 1130-2-400, and ER 1165-2-400) now fully and competently describes sound approaches to the design, operation, and maintenance of recreation and fish and wildlife enhancement programs.

Thus, recognition of resource management as a legitimate part of the Corps Civil Works Program has developed very recently. It is against this backdrop of change that this discussion of existing Corps field organization is set.

---

[a] Knetsch, J. L. and W. J. Hart. 1967. Outdoor Recreation Policy of the U. S. Army Corps of Engineers: Initial Review and Suggestions for Improvement, Office, Chief of Engineers, Washington, D. C.

[b] Crafts, E. C. 1970. How to Meet Public Recreation Needs At Corps of Engineers Reservoirs. Office, Chief of Engineers, Washington, D. C.

Table 3-8. Location of Recreation Planning Function, 19 Engineer Districts.

District	Engineering	Separate	Operations
1. Memphis	x		
2. Vicksburg	x		
3. Omaha		x	
4. New England		x	
5. Baltimore[a]	x	x	
6. Philadelphia	x		
7. Rock Island	x		
8. St. Paul			
9. Portland	x		
10. Seattle	x		
11. Walla Walla	x		
12. Nashville	x		
13. Pittsburg	x		
14. Savannah	x		
15. Mobile	x		
16. Los Angeles	x		
17. Sacramento	x		
18. Little Rock		x	
19. Tulsa	x		

[a]The environmental resources branch, planning division, and the design reports section, engineering divison, share responsibility.

1. Horizontal Division of Functions

Traditionally the conceptualization of projects from broad-gauged river basin analysis through the preparation of a definite project report is the responsibility of the Engineer District engineering division. Determination of needs for flood protection, hydroelectric power, waterborne commerce, and water supply, and the economic and environmental benefits to be gained by meeting these and other needs, are compared against the supply of water, the physical feasibility of construction, and the economic and environmental cost of capturing the benefits. Once authorized, detailed design and the drawing of specifications is performed, again by the engineering division. The construction-operations division(s) then assures construction to the specified standards and assumes responsibility for the management of the facility. RED personnel (assigned division status within most Engineer District offices) support both functions. The planning and control branch estimates the real property that should be acquired and contributes the estimates of acreage and costs to the engineering division's project report. Upon authorization, specific parcels to be acquired are identified and appraised. Thereafter, the acquisition branch actually acquires the real property. When the project is complete, management of the property is the responsibility of the management and disposal branch.

There is a marked difference in the time frames within which the engineering and management functions are considered. The engineering function is discrete; that is, even though a single WRDP is only one of a series of WRDPs envisioned, the engineering function ends with construction. Management's involvement, on the other hand, extends over the entire life of the project, during which conditions not foreseen at the time of design may develop.

The horizontal division of the management function at the Engineer District level does not provide an adequate overview of the total water and land management picture. This situation was noted at Alamo, Ashtabula, Cordell Hull, Cumberland, Leech, MRP #21, Foster J. Sayers, Oahe, Ouachita, and Fort Peck; 34.5% of the sample.

There is also a resultant competition among divisions for manpower and funds. This situation, while not explicitly cited, is endemic in all Engineer District offices. In addition, there is insufficient cooperation and communication among the three main elements of management - planning, operations, and RED. A closely allied problem is the lack of a common information base. Planning personnel tend to rely upon data used to generate pre-authorization reports, operations division personnel work within the data prescribed by the RRMS because operating and Code 710 budgets are allocated from this base, and RED personnel utilize those data pertinent to the administration of outgrant instruments.

It is difficult to assess responsibility for success and failure. If a facility is poorly located, operations personnel point to the lack of practical know-how on the part of the planners; if an internal circulation road system operates inefficiently, the planners point to inept management; and if a concessioner fails, both point to the realty specialists.

Another problem is the lack of a focal point for communications with other public agencies. Should a state or Federal agency address its recreation and/or fish and wildlife questions, proposals, and criticisms to the planners, the managers, or the outgrant administration?

Of considerable importance is the confusion of project personnel concerning responsibility for recreation, fish and wildlife, and land use decisions at the Engineer District level. The project staffs are nominally responsible to an Engineer District recreation-resource management branch or section, yet major policies and decisions that affect their work and relations with visitors and local residents are, or seem to be, made by Engineer District personnel in other major divisions. Project personnel were found who believe that facility plans prepared at the Engineer District level are unrealistic and must be modified before they are implemented (Hartwell), that their recommendations will not be accepted or sought by Engineer District level staff (Ashtabula, Table Rock, Hopkinton-Everett, and Wappapello), and that only Engineer District level personnel can deal with lessees and local government officials (Mosquito Creek). This confusion, of course, reduces the effectiveness of project management.

Solutions proposed without the benefit of field experience may not be cost effective. The State Park Superintendent at Alamo indicated that some state reluctance to manage Corps-built facilities stemmed from the custom made nature of even standard items such as pumps and light sockets; at Clark Hill, the design of comfort stations was reported to make routine repairs difficult.

A cause of inefficiencies is an attitude by Engineer District planning personnel that recreation and, particularly, fish and wildlife activities, are peripheral to their main work. They must travel from the Engineer District headquarters to field locations and confront strange conditions. Instances where recreation and fish and wildlife were thought

of as add-ons were reported at Alamo, Cumberland, Foster J. Sayers, Eufaula, Robert S. Kerr, Colebrook, Isabella, Ouachita, Oahe, and Fort Peck.

Also noted was a tendency to solve problems through construction rather than application of improved management. Evidence of this bias was specifically noted at Oahe, Fort Peck, Alamo, and Ashtabula, but is probably more pervasive.

The degree to which management is delegated to project level personnel is directly related to the professional capabilities of the project staff. Many of the problems enumerated occur at WRDPs where all or most of MRL has been outgranted to state agencies, and Corps officials assume there is no Federal management responsibility other than operation of the project works. In such cases, Corps project staff may consist of a dam tender and assistant allotted only sufficient operating and maintenance funds to care for the grounds around Corps buildings (Hopkinton-Everett, Foster J. Sayers, Mosquito Creek, Alamo).[a]

2. Uneven Distribution of Corps Project Personnel

One of the consequences of uneven distribution of Corps project personnel is the infrequent inspection of Corps lands and inadequate contact with visitors and contiguous land owners and residents. Encroachment, trespass, and vandalism go undetected for long periods.

The role of the Corps as a builder and operator of engineering works and the location of offices and buildings at construction sites has focused Corps field activities

[a]An analogous situation exists at natural lakes where Corps MRL acreage is small (Leech and Pend Oreille).

around the major facility such as the dam. Customarily, Corps offices occupy construction era buildings at this location while new buildings are located nearby. This arrangement is very satisfactory for those operations associated with the dam and/or other project works. There are no sub-project offices or stations distributed along the length and breadth of the project.

This arrangement may be adequate for relatively small WRDPs, but when a WRDP has a linear configuration of 100 miles or more without a road system on Corps land close to the shoreline (Oahe, Clark Hill), adequate monitoring of activities on and adjacent to Corps land from a single headquarters is very difficult.

3. Numbers and Competence of Personnel

Management of renewable natural resources is a field of endeavor that has evolved in this country during the past 50 years. Recognition of the interactions between the natural sciences, design sciences, and social sciences is even more recent.

It has been demonstrated that the Corps exercises management responsibility for a significant amount of important and valuable natural resources. The effectiveness of the Corps' response to the management challenge is as dependent upon the number of persons competent, by training, interest, and experience in this field, as is the demonstrated effectiveness of the Corps in engaging persons competent in planning, constructing, and operating engineering works.

Analysis is complicated simply because no one discipline has a preeminent position in the field. Sanitary engineers, foresters, landscape architects, wildlife biologists,

geographers, economists, and sociologists are among the disciplines that make valuable contributions to resource management. Thus, it is not possible to draw conclusions solely from the training of an incumbent or a job title.

Two measures of resource management effectiveness, however, are the number of professional persons occupying responsible field positions in an organization, and the professional specialties of the technical support staff.

Poor resource management by the Corps, where it occurs, results from an inefficient administrative structure and/or insufficient numbers of the right kinds of personnel at the right place. Part of the poor management problem may be attributed to the relatively recent nation-wide entry of the Corps into the direct management of resources. The Corps' organization simply has not had time to adjust to the newly acknowledged obligations (as noted, some Engineer Districts had not established a recreation-resource management function at the time of the study).

Nonetheless, the dimensions of the issue can be seen by the types of permanent civilian recreation-resource managers employed by the WRDPs surveyed (Table 3-9). Only 48.16 person-years/year of professional level staff (8.8% of all field staffing at 29 WRDPs) are permanently assigned to these projects. The ranger and park technician[a] force amounts to 88.3 person years (16.2%), and there are 61 person-years of sub-professional, primarily clerical, personnel (11.2%), and 347 person-years of maintenance and laborer effort (63.7%).

Significant numbers of professional personnel at the project level were found only at the six WRDPs studied in the Savannah and Nashville Engineer Districts. With the excep-

---

[a]This is arbitrary. Some rangers have natural science degrees and are professionals, but there is no requirement that rangers meet professional standards. Thus, ranger positions are reported separately.

Table 3-9 Permanent Resource Personnel at 29 WRDPs.[a]

Project	Professional Titles	Rangers & Park Techs	Sub-Professionals	Maintenance	Total
Wappapello	3	1	1	5	10.0
Ouachita	2	2	2	16	22.0
Fort Peck	5	2	10	25	42.0
Oahe	.50	5[b]	5	15	25.5
Colebrook	.14	.14	2	0	2.28
Hopkinton-Everett	.20	0	4	0	4.20
Foster J. Sayers	0	0	3	0	3.0
C & D Canal	2	1[c]	2	52	57.0
MRP #21	0	.16	2	11	13.16
Ashtabula	.16	0	2	0	2.16
Leech Lake	.16	0	1	0	1.16
Pond Oreille	3	1	3	17	24.0
John Day	2	6	0	12	20.0
Dworshak	2	0	1	3	6.0
Cordell Hull	2	4	1	4	11.0
Cumberland	2	6	1	9	18.0
Old Hickory	2	6	1	10	19.0
J. Percy Priest	2	5	1	11	19.0
Mosquito Creek	0	0	0	3	3.0
Warrior Lake	3	1	2	11	17.0
Jones Bluff	3	5	2	2	12.0
Clark Hill	6	5	7	17	35.0
Hartwell	3	8	3	17	31.0
Alamo	0	0	2	0	2.0
Isabella	1	10	1	4	16.0
Table Rock	3	3[b]	0	22	28.0

Table 3-9. (Continued)

Project	Professional Titles	Rangers & Park Techs	Sub-Professionals	Maintenance	Total
Eufaula	0	5[b]	0	34	39.0
Robert S. Kerr	0	5[b]	0	14	19.0
Texoma	1	7[b]	2	33	43.0
Totals	48.16	88.3	61	347	544.46
% of Total	8.8	16.2	11.2	63.7	100

[a] In person years/year. When personnel have responsibilities for more than one WRDP, the person year is evenly divided by number of WRDPs those persons cover.

[b] Park managers below GS-9.

[c] Park guide.

tion of seven civil engineers, these persons are trained in some resource management discipline (forestry, wildlife management) and account for 17 of the professional person years/year available for resource management. The remaining 31 professional person years/year are allocated among 23 WRDPs. Even when the WRDPs consisting of former natural lakes and the WRDPs where most of the MRL acreage is outgranted to other public agencies are deducted from the totals, the 31 Corps professional personnel must cope with 17 WRDPs with 867,819 acres of MRL, 8,065 miles of shoreline, which recorded 17.4 million visitors on 31,275 acres of Corps managed recreation areas in 1973 (as derived from Table 2-3).

Analysis of staffing levels and resource management capabilities at the Engineer District level is far more difficult because personnel from various divisions are used to perform recreation-resource management work. This complexity is evident in the organization charts and tables for 19 Engineer Districts. No two are the same, and comparable branches or sections in the engineering division, say recreation planning, may differ widely in the number and types of personnel available for recreation-resource management work.

A similar situation exists in environmental resources branches and sections. At Hopkinton-Everett, New England Engineer Division personnel reported that approximately 75% of three environmental resources branch professionals (2.25 person years/year) was devoted to recreation-resource management work; two of the individuals referred to are engineers and one is a landscape architect. The majority of resource management professionals at the Engineer District level were located in the environmental resources branch/section.

Matters in the recreation-resource management function are more clear cut. The total number of professional person years/year in the 19 Engineer Districts was 95. Although the allocation of the 95 person-years/year to the individual projects was not available, 25 person-years/year were in engineering and the recreation-resource management function was headed by an engineer in 7 districts.

There are two reasons why the number of professional personnel in the real estate division management function in the 19 Engineer Districts cannot simply be totaled from the organization charts included in the case studies: (1) uncertainty about the distribution of professional time between management and disposal when the two activities are combined in a single branch; and (2) uncertainty about the civil responsibilities of resource professionals with military responsibilities (for example military timber management by RED foresters in the Savannah Engineer District). The total professional management force at the 19 Engineer Districts is 146 person-years/year.

Use of the tables of organization to describe the professional characteristics of Corps personnel may be misleading. In the course of the study, an incumbent dam tender had been retitled resource manager (Mosquito Creek), a supervisory recreation planner was trained as a forester (Nashville), a park manager was a civil engineer at one WRDP (J. Percy Priest) and another was a retitled park ranger (Oahe). The individual discrepancies may not appear serious, but in the aggregate, one cannot be uniformly sure of what kind of management expertise the Corps is employing to manage land and water resources.

Another factor that affects the number and type of recreation and fish and wildlife personnel at the Engineer District and project levels is the nature of the overall Engineer District workload. This factor alone is the reason that some Engineer Districts have very few WRDPs in which the recreation, fish and wildlife potentials are presently recognized. (Table 3-10 shows the unevenness of the district recreation potential.) It is unreasonable to expect the same level of resource management awareness and expertise in the planning, operations, or real estate functions of the Memphis Engineer District with only one moderately large, attrative WRDP or Nashville Engineer District (8 large, attractive WRDPs) or the Tulsa Engineer District (27 large WRDPs). The importance of a WRDP to the visiting and regional populations and its susceptibility to degradation, however, is no different whether the WRDP is one of a 100 or the only project in an Engineer District.

Examination of the organization charts also reveals that the largest number of natural resource related disciplines are slotted in the district engineering/planning division(s). The number of persons and their titular discipline are shown in Table 3-11. The preponderance of engineers is evident. This is not as significant, however, as the dominance of section and branch chief positions by supervisory civil engineers. This number of civil engineers and their dominance in supervisory positions is not as surprising as the number of civil engineers in the recreation-resource management branches/section.

Resource trained personnel may enter Corps service at the Engineer District level. They may be called upon to

Table 3-10. Total Projects and Recreation Areas by Engineer Districts Selected.

	No. of Projects	No. of Recreation Areas
Memphis	1	19
Vicksburg	7	117
Omaha	10	152
Baltimore	6	6
Philadelphia	4	5
Rock Island	14	201
St. Paul	26	36
New England	31	65
Portland	15	100
Seattle	5	17
Walla Walla	7	41
Nashville	8	226
Pittsburgh	127	580
Mobile	18	282
Savannah	3	156
Los Angeles	8	13
Sacramento	8	34
Little Rock	20	153
Tulsa	27	277

Table 3-11. District Recreation Management Personnel

District	Project Planning Branch or Section[a]					Recreation-Resource Management Branch or Section					Management and Disposal		Totals
	Engineers[b]	Landscape Architect	Biologist[c]	Outdoor Recreation Planners	Other	Engineers[b]	Landscape Architect	Biologist	Outdoor Recreation Planners	Other	Realty	Other	
Memphis	6[d]	0	0	0	0	Does not exist within the District Organization					2[d]	1	9
Vicksburg	14[d]	0	0	0	5	3[d]	1	3	1	3	3	3	36
Omaha	0	1	6[d]	2	1	0	0	2	3[d]	1	12	8	36
New England[e]	5[d]	1	6	0	4	1[d*]	1	0	0	0	4[*]	3	25
Baltimore[f]	9[d]	2	3	3	4	0	0	0	2[d]	1	9	4	37
Philadelphia	Does not exist within the District Organization					Does not exist within the District Organization					4	2	6
Rock Island	13[d]	1	6[d]	0	9	0	0	0	1[d]	0	5	0	35
St. Paul	1[d*]	1	0	3	0	2[d*]	0	0	0	1	Does not exist within the District Organization		18
Seattle	0	3	6[d*]	0	2	Does not exist within the District Organization					1	0	12
Portland	2	7[*]	0	1	2	0	0	8	2[d]	2	5	1	30
Walla Walla	1	3[d*]	7[d*]	0	0	0	0	2	3[d]	0	1	0	17
Nashville	5[d]	2	2	1	0	0	0	0	7[d]	0	2	1	20
Pittsburgh[h]	10[d]	4	3	1	2	4	0	0	2[d]	1	0	2[d]	29
Mobile	1	6[d*]	0	1	2	2[d]	0	0	2	1	6	5	26
Savannah	4[d*]	1	0	2	0	1	0	0	1[d]	0	6	7	22
Los Angeles	5[d*]	0	4	0	3	Does not exist within the District Organization					8	4	24
Sacramento[f]	3	0	7[d*]	2	3	1[d*]	0	0	1	3	6	2	28
Little Rock	5[d*]	1	2	3	0	3[d]	0	1	5[d]	4	8	3	35
Tulsa	6	2	5	2[d*]	7	8[d]	0	1	0	4	11	7	53
Totals	90	35	57	21	44	25	2	17	30	21	93	53	488
			247					95			146		

Table 3-11 (Continued)

[a]Project planning is defined as a term which includes a branch and/or sections within the district organization that is responsible for recreation planning.

[b]Includes engineering technicians and aids.

[c]Includes ecologists, environmental resource specialists, and biological aids.

[d]Denotes profession of supervisor or supervisors.

[e]Division.

[f]The Project Operations Section includes Recreation-Resource Management responsibilities.

*Indicates section or sections within a branch.

participate in master planning an existing WRDP without having had any field experience; they can look forward to very little advancement within the district, and their chain of advancement is by and large limited to the planning or engineering divisions. A person with similar training who enters Corps service at the project level has little room for vertical career movement.

4. Corps Organization Findings

a. Positive

(1) OCE has emphasized the significance of existing WRDP resources in providing low cost outdoor recreation opportunities and contributing to balanced state and regional land use programs.

(a) Full responsibility for outdoor recreation planning was assigned to the planning division and a recreation-resources management branch was formed in OCE in 1967 and 1971, respectively.

(b) Engineer Regulations have been issued that accord full "project purpose" status to recreation and fish and wildlife enhancement at all WRDPs.

(2) The decentralized Corps organization and horizontal staff structure at the Engineer District level provide great flexibility to meet a wide variety of conditions and work loads.

(a) The horizontal, staff type, organization at the Engineer District level permits task sharing by professional personnel; for example, landscape architects in the engineer division may work on definite project reports part of the time (an engineering division task) and on public facilities

plans for a 20-year old WRDP (an operations division task). Project operations personnel at WRDPs (dam tenders) can perform recreation-resource management functions simply because they are headquartered at the WRDP.

(b) Project operation personnel (dam tenders) can also perform recreation-resource management functions at the WRDPs.

(3) The Corps is recruiting and employing trained resource professionals at the Engineer District level.

(4) The Corps organization exhibits the characteristics of an agency shifting from an advance planning/ construction posture to a management posture.

b. Negative

(1) Many of the deficiencies in recreation, fish and wildlife, Corps and contiguous land use, and real estate programs and practices are directly attributable to insufficient numbers of the right kinds of personnel in the right places.

(a) In the sample, 31 Corps professional personnel were distributed among 17 WRDPs with 867,819 acres of manageable land, 8,065 miles of shoreline, and 17.4 million visitor days of use on 31,275 acres of Corps managed recreation area.

(b) Of 95 professional person-years/year of recreation-resource management branch capability in 19 Engineer Districts visited, civil engineers comprised 25 person-years/year and headed seven of the branches.

(c) The largest number of persons with natural resource related training are in Engineer District

level engineering/planning divisions, not in recreation-resources management.

(d) Because supervisory positions at the Engineer District level are designed for and occupied by engineers, professional resource personnel possess few career advancement opportunities and exhibit a high turnover rate.

(e) Corps WRDP personnel based at the dam site cannot effectively inspect Corps land, perform visitor contact work, and be aware of resource conditions throughout the WRDP.

(2) Task sharing across divisions permits maximum use of professional personnel, but tends to create an attitude that recreation-resources management is a peripheral activity. Divided responsibility creates competition for manpower and management funds, results in the lack of a common data base, and makes it difficult to fix responsibility for success and failure.

(3) Decentralization over a long period of time has encouraged the development of Engineer Districts with markedly distinctive characteristics. State agencies that deal with two or more Engineer Districts report their relations are akin to working with separate agencies rather than field offices of the same agency.

CHAPTER 4

SELECTED FEDERAL AND STATE RESOURCE AGENCIES

Selected Federal and state agencies with the responsibility for recreation, fish and wildlife, and general resource management were studied to establish a baseline against which alternative courses of action with respect to Corps land and water resources could be evaluated and to serve as a guide in describing the Corps general performance with respect to executing its recreation and fish and wildlife enhancement responsibilities.

Four Federal agencies were selected by OCE for study: USFS, NPS, USF&WS and BLM. Two additional agencies, the TVA and BuRec, were added on the recommendation of CZRC with the approval of OCE. In addition, discussions were held with officials of the BOR and the Council on Environmental Quality.

Factors considered in the selection of the six state recreation and/or fish and wildlife agencies included: (1) the total Federal, state, and local public recreation opportunities within each state: (2) the interrelationships that exist between the Federal and state fish and wildlife programs; (3) the number of Corps WRDPs that are entirely or partially within each state; (4) the existence of innovative land use, recreation, and fish and wildlife practices; and (5) the structure of the state resource management program.

Each state was evaluated according to these factors through the use of data from the Bureau of the Census, National Recreation and Parks Association, Council of State

Governments, and the Corps. Additionally, recommendations were solicited from the American Forestry Association, American Fisheries Society, National Wildlife Federation, Wildlife Society, National Recreation and Park Association, International Association of Game, Fish and Conservation Commissioners, and the Sport Fishing Institute.

On the basis of its evaluation, CZRC recommended and OCE approved the following six state agencies as representative of state recreation and fish and wildlife experience: Washington State Parks and Recreation Commission, Texas Parks and Wildlife Commission, Pennsylvania Bureau of State Parks, Tennessee Wildlife Resources Agency, Missouri Conservation Commission, and Minnesota Department of Natural Resources.

Individual profiles were developed for each Federal and state agency which consist of statutory references, raw budget data, tables of organization, information derived from interviews with key agency personnel and executive and legislative budget staffs, and a study of annual reports and information system documents. The profiles were organized into seven sections which consider: (1) the nature of their statutory authorities and responsibilities for managing recreation and fish and wildlife resources; (2) their administrative organizations; (3) the sources and sizes of their recreation and fish and wildlife budgets; (4) their provisions for payments to local governments in lieu of taxes; (5) their administrative fees and charges; (6) their authority to acquire land for recreation purposes; and (7) their authorities and procedures for leasing land and/or facilities to private individuals.

The results of the research are presented under the headings used to organize the basic materials.

A. Authorities and Responsibilities

1. Federal

The six Federal agencies studied were created for and originally authorized to perform limited specific purposes. Multiple use laws which specifically include recreation as an authorized management objective have only been added during the last twenty years.

The USFS was created in 1905 to administer forest reserves in order to improve and protect the forest, secure favorable conditions of water flow, furnish a continuous supply of timber for the needs and use of citizens of the United States, and to eliminate agriculture and mineral extraction. It was not until 1960 that the USFS was given an explicit Congressional directive to manage forest resources for outdoor recreation, range, timber, watershed, and fish and wildlife purposes.

The basic authority for the NPS was enacted in 1916 "to promote and regulate the use of national parks, monuments, and reservations, for the purpose of conserving the scenery, the natural and historic objects and the wildlife...". Recreation was not authorized until Recreational Demonstration Areas were transferred from the Resettlement Administration to the Secretary of the Interior in 1942. Further, the NPS did not expand its definition of other public purposes to include recreation until 1954.

The BLM, successor to the General Land Office, was created as a vehicle for the transfer of public domain lands to states, local governments, corporations, and private

individuals, under the provisions of the public land laws.

The USF&WS implementing legislation was specifically oriented toward the acquisition of lands for fish and wildlife management. The UFS&WS did not have a comprehensive fish and wildlife policy, nor did it include in its policies attempts to meet the public demand for recreational fishing until 1956. Recreation as a management objective of the national refuge system was not recognized until 1966.

The TVA was created in 1933 "...to improve the navigability and to provide for the flood control of the Tennessee River, to provide for reforestation and proper use of marginal lands in the Tennessee Valley, to provide for agricultural and industrial development of the valley and to provide for the national defense...". Recreation has never been a specified purpose of TVA programs and is therefore only authorized on a project by project basis.

The BuRec was created in 1902 to locate, construct, operate, and maintain works for the storage, diversion, and development of waters for the reclamation of arid and semi-arid lands in the western states. Recreation and fish and wildlife considerations have been a part of individual project authorizations.

Whereas present management responsibilities for recreation, fish and wildlife in the USFS and the NPS are comprehensive and have broad application, they are narrowly applied to specific situations in the BLM, TVA and BuRec and are often delegated to other Federal and state agencies.

Generally USFS policy prefers permanent, maintenance-free recreation facilities that enhance the natural landscape, serve the public need while protecting public health, and

which do not conflict with other resources uses. Federal law requires USFS employees to aid in the enforcement of state laws designed to protect fish and game.

NPS recreation authorities are not as concise as those of the USFS. Administrative policies for natural areas, historical areas, recreation areas, and cultural areas cover resource management, resource use, and physical development.

The BLM recreation policy encourages state and local governments and private agencies to develop public facilities whenever such development will be consistent with long range management plans of the Bureau and will give priority to undeveloped sites where public recreational demand exceeds presently available opportunities. It is general policy to administer all public lands for the benefit of all wildlife with an added emphasis on the protection and restoration of the habitat of rare and endangered species.

The USF&WS permits public recreational use of fish and wildlife areas wherever practical and consistent with authorized Federal operations and the USF&WS's primary objective to aid in the conservation of the nation's fish and wildlife. The USF&WS acts as the Federal government's main consulting agency for the conservation and enhancement of fish and wildlife.

The TVA and the BuRec generally directly develop areas for public recreation and manage wildlife habitats on a very limited basis. Each agency has made lands available, however, to other Federal agencies, states, local governments, and private inviduals, through transfer, lease, and licensing procedures. The TVA has encouraged the development of state, regional, and local planning and zoning activities and has provided technical assistance and land for state and local park, fish, and wildlife activities. Even with decades of

of encouragement to state and local agencies, TVA has found it necessary, beginning in 1970, to begin direct administration of public recreational access areas.

2. State

The state agencies selected represent a national cross section of the administration of parks, fish and game, and other natural resource functions by single purpose and multiple purpose agencies. Most of the state parks and wildlife duties of each agency began elsewhere in the state government and were moved by reorganizations within the last fifteen years. A notable exception is the Missouri Conservation Commission which was constitutionally created in 1936 and has retained its original duties and organization since that time. There have been only three directors of the department since its creation.

Like the Federal agencies, the states do not include recreation and fish and wildlife as authorized purposes for every agency. Table 4-1 presents the authorities, responsibilities, dated created, and administration for each state agency studied. Table 4-2 summarizes basic descriptive information about each agency.

Three agencies, the Washington State Parks and Recreation Commission, the Pennsylvania Bureau of State Parks and the Tennessee Wildlife Resources Agency, have only single functions. On the other hand, the Texas Parks and Wildlife Commission, the Missouri Conservation Commission and the Minnesota Department of Natural Resources divide multiple functions among departmental divisions such as parks and recreation, forestry, fish and wildlife, and soil and water.

Table 4.1. Administration, Authorities and Responsibilities of State Agencies Studied

Agency	Administration	Date Created	Authority	Responsibilities				
				Rec.	Parks	For.	F & W	Soil & Water
Washington State Parks and Recreation Commission	Commission	1947	Specific	X	X			
Texas Parks and Wildlife Commission	Commission	1963	Broad (Multiple uses)	X	X		X	
Pennsylvania Bureau of State Parks[a]	Sub-cabinet	1970	Specific	X	X			
Tennessee Wildlife Resources Agency	Commission	1974	Specific				X	
Missouri Conservation Commission	Commission	1937	Broad (Multiple uses)			X	X	
Minnesota Department of Natural Resources	Cabinet	1974	Broad (Multiple uses)	X	X	X	X	X

[a]Although the Pennsylvania Bureau of State Parks' authority is limited to the administration of park lands, the Bureau is located within the Department of Environmental Resources under the Deputy Secretary of Environmental Resources. The Deputy Secretary is also responsible for the operating bureaus of design, operations, forestry, and soil and water conservation.

Table 4.2: Profile Summary

STATE	AGENCY	AUTHORITY	BUDGET	FUNDS	ADMIN	IN LIEU TAX PAYMENTS	CONDEMNATION AUTHORITY	LEASING	STATE
TENN.	Wildlife Resources Agency	Statute	INCR	Ded	Comm	Yes	ADMIN	Specific Leasing Authority No Standard Concessions Pol.	TENN
TEXAS	Parks and Wildlife Commission	Statute	ZERO-BASE	Ded/Gen 80%/20%	Comm	Yes	ADMIN	Specific Leasing Authority Standard Concessions Policy	TEX
MO.	Conservation Commission	Constitution	INCR	Ded	Comm	Yes	ADMIN	No Specific Leasing Auth. Standard Concessions Contract	MO
MINN.	Dept. of Natural Resources	Statute	INCR	Ded/Gen 50%/50%	Cab	Yes	LEGIS	Specific Leasing Auth. No Standard Concessions Pol.	MINN
WASH.	Parks and Recreation Commission	Statute	INCR	Gen	Comm	No	ADMIN	Specific Leasing Authority Standard Concessions Policy	WASH
PENN.	Bureau of State Parks	Statute	INCR	Gen	Sub-Cab	Yes	ADMIN	Specific Leasing Authority No standard Concessions Pol.	PENN

Notes:

Budget. INCR equal incremental, justifying additional request
ZERO-BASE equal rejustification of entire program

Funds. Ded equal substantially dedicated sources
Gen equal substantially from general revenue
(Approx. percentage shown when significant amount from both sources)

Admin. Comm equal Commission
Sub-Cab/Cab = Sub-Cabinet/cabinet

Condemnation Authority: ADMIN = Administering Agency of Department
LEGIS = Legislative only

The Washington Parks and Recreation Commission is generally responsible for the care, charge, control and supervision of all parks and parkways acquired or set aside by the state.

The Texas Parks and Wildlife Commission formulates park and wildlife policy which is in turn administered by the Parks and Wildlife Department. The Department is organized into four divisions: Parks, Enforcement, Wildlife, and Fisheries. Divisional responsibilities are:

> Parks - to execute the department's operational responsibilities for the State Parks System;
>
> Enforcement - to enforce the more than 1,000 state laws which relate to parks and wildlife;
>
> Wildlife - to promote sound wildlife management and to increase recreational opportunity through improved methods of game production and harvest;
>
> Fisheries - to provide maximum fishing opportunities and optimum seafood product yield.

The Pennsylvania Bureau of State Parks is charged with the effective management of all Commonwealth state park resources.

The Tennessee Wildlife Resources Agency is responsible for the protection and conservation of wildlife through the acquisition of lands and waters suitable for the operation of fish hatcheries and for wildlife management, and for providing public use by entering into cooperative agreements with private

individuals and governmental agencies for management purposes.

The Missouri Conservation Commission has the duty to control, manage, restore, conserve, and regulate all bird, fish, game, forestry, and wildlife resources.

The Minnesota Department of Natural Resources is a cabinet level executive department which reviews land appraisals, installs and operates recreation facilities on public land, protects forest lands from fire, manages state forest and swamp land, controls hunting and fishing, enjoins interference with extra-territorial waterflow, establishes boundaries, stipulates low water marks, rents and leases property, issues licenses and permits, manages recreation areas, conserves wild rice, designates wilderness areas, grants easements to the United States and performs topographic surveys.

B. Administrative Organization

1. Federal

Administration of the Federal agencies is decentralized. The Washington offices generally rely on regional offices for identification of problems, the issuance of permits, financial management, site planning, contributions for reports, drafting of environmental impact statements, coordination with other governmental agencies, and the inventory and classification of lands.

Since its interest is regional rather than national, the administration of the TVA is centralized under a Board of Directors directly responsible to the President of the United States. District activities are nonetheless maintained for the purpose of implementing policies.

With the exception of the TVA and BuRec, each

Federal agency is headed by a director or chief who is assisted by five deputies. BuRec is headed by a Commissioner who has four assistants and the TVA has an Office of the General Manager who is directly responsible to the Board of Directors.

2. State

The organization of Washington, Texas, Tennessee, and Missouri is similar to that of TVA, each being headed by a commission appointed by the governor and approved by the state senate. Generally, commissions institute policy and appoint an executive director to administer sophisticated professional departments that implement the policies. Each executive director is assisted by deputy directors for various line and staff functions.

The Pennsylvania Bureau of State Parks and the Minnesota Department of Natural Resources are subcabinet and cabinet level executive departments and are headed by a Deputy Secretary for Resources Management and a Commissioner, respectively.

Pennsylvania, Tennessee, and Minnesota use a regional structure and regional managers with assistant managers for functional programs in enforcement, fish and wildlife, forestry, recreation and water. Washington, Texas, and Missouri operate similar functional programs through a direct line organization.

C. Budgets, Funding and Unit Costs

1. Federal

With the exception of the TVA, budgets for the Federal agencies are developed in Washington, and the actual administration and detailed allocation is made at the regional level. TVA's budget is developed in the main offices in

Knoxville, TN, and is allocated from the regional offices.

Agency fiscal data are not comparable because actual fiscal data were either: not available; available as a total budget outlay or appropriation rather than as an appropriation for recreation, fish and wildlife; not available for comparable years; or only available as a budget request rather than an appropriation. Hence agency fiscal data is noted here only for general reference.

(a) USFS: Budget outlays for recreation and fish and wildlife for FY 1972-1975 are $47,661,000, $52,652,000, $59,038,000, and $61,306,000, respectively.

(b) NPS: the total appropriation for FY 1973 was $120,941,000.

(c) BLM: budget requests for recreation and fish and wildlife for FY 1975 and FY 1976 were $9,500,000. The budget estimates were equal because most recreational program estimates did not significantly increase and planning related to recreation and wildlife was not funded for FY 1976.

(d) USF&WS: operation and maintenance appropriations for FY 1973-1974 were $79,284,000, $85,989,000, and $101,295,000, respectively.

(e) TVA: total appropriations for FY 1973-1975 were $64,550,000, $45,676,000, and $74,600,000, respectively.

(f) BuRec: there was no budget information available for recreation and fish and wildlife management at the 18 Bureau administered areas.

Most Federal agency funding is directly appropriated. Some agencies such as TVA and BuRec use special sources of funds, such as monies from the sale of hydroelectric power, as part of their program budgets.

Funding for USFS recreation activities is from three sources: Interior and Related Agencies appropriations, the revenues dedicated to the Land and Water Conservation Fund, and 65% of the admission and user fees collected by the USFS under the Land and Water Conservation Fund Act (only about 10% of annual budgets are derived from the latter source).

NPS park management functions are divided into two portions. The first, operation of the National Park System is funded from general appropriations; whereas the second, the planning, development, and operation of recreation facilities, is funded by the Land and Water Conservation Fund.

The BLM directly funds recreation and resource management, construction, and maintenance on the public domain and on the Oregon and California reverted grant lands.

Information on USF&WS funding specifically for recreation, fish and wildlife was not available. Funding is by general appropriations, and special funds are used to pay expenses necessary for scientific and economic studies,

conservation, management, investigation, protection, and utilization of sport fishing and wildlife resources.

TVA derives its funds from general appropriations and the receipts from the sale of power. All recreation funding comes from appropriations. TVA power production and distribution is a self sustaining program that sells power at wholesale rates to 110 municipal and 50 cooperative electric distribution systems.

Most of the recreation and fish and wildlife funding for BuRec is from general appropriations; however, under special cost sharing agreements the Bureau administers special revenues or advance project revenues from general appropriations to be later reimbursed by non-Federal entities.

Federal budgeting procedures use incremental budgeting and do not include unit costing. The USFS computes costs per recreation day but only on a limited basis which relates to administrative, cleanup, and maintenance dollar needs for various recreational activities at selected National Forest areas.

2. State

The budgets, sources of funds, and use of unit cost analyses are more diversified at the state level. State budget data, as is the case with Federal budget data, were not available in comparable form and will only be noted briefly.

(a) Washington State Parks and Recreation Commission: total expenditures and requests for operating expenses in FYs 1972, 1973, 1974, 1975, 1976 and 1977 were: $6,242,818, $7,566.743;

$8,957,926; $9,195,299 (estimated); $15,227,761 (requested); and $12,671,572 (requested), respectively. In addition, there is a capital budget request of $17,030,200 for the FY 1975-1977 biennium.

(b) Texas Parks and Wildlife Commission: requested appropriations for FYs 1976 and 1977 were $58,443.670, and $63,754,535, respectively, for both operating and capital expenditures.

(c) Tennessee Wildlife Resources Agency: expenditures for both operating and capital expenditures, for FYs 1973, 1974, and 1975 were $6,211,724, $7,257,830, and $6,310,846, respectively.

(d) Minnesota Department of Natural Resources: expenditures and requests for both operating and capital expenditures for FYs 1971, 1972, 1973, 1974, and 1975 were $19,308,823; $22,529,956; $24,283,084 (estimated); $21,939,570 (legislative conference report recommendation); and $21,981,431 (legislative conference report recommendation), respectively.

(e) Missouri Conservation Commission: budget request for both operating and capital expenditures for FY 1975 is $13,821,028.

(f) Pennsylvania Bureau of State Parks: expenditures and requests for "Development, Operation and Maintenance of Recreational Areas and Facilities" for FYs 1973, 1974, and 1975 were $13.6 million; $15.2 million; and $16.6 million (requested), respectively. In addition, there is a proposed capital budget expenditure for forestry, flood control, and recreation of $10.2 million in FY 1975.

Funding is generally from two sources, general and dedicated. Dedicated funds are usually derived from collection of entrance and user fees or from the sale of hunting, fishing and boating licenses. The Washington State Parks and Recreation Commission, the Tennessee Wildlife Resources Agency and the Pennsylvania Bureau of State Parks are funded primarily from general funds. The Missouri Conservation Commission is funded by dedicated funds. The Texas Parks and Wildlife Commission and the Minnesota Department of Natural Resources allocate dedicated and general funds among parks, wildlife, and occasionally forestry activities.

Generally, the Washington State Parks and Recreation Commission is an independent agency almost totally funded from general revenue. Texas Parks and Wildlife Commission funding is 80% dedicated and 20% general. All funding is divided between the parks and wildlife functions. The Pennsylvania Department of Environmental Resources is

supported by the general fund and its revenues, with minor exceptions, are returned to the general fund. Most Tennessee Wildlife Resources Agency funding is from the Wildlife Resources Fund, which is supported by hunting and fishing license sales and concomitant Federal grant funds.

The Missouri Conservation Commission is funded from dedicated sources of funds. Dedicated funds are divided among forestry, fish, and wildlife activities; 12.1% to forestry, 16.4% to fish and 39.8% to wildlife.

Funding for the Minnesota Department of Natural Resources is generally received from dedicated sources for fish and game activities and from the general fund for park and recreation activities.

Texas uses a unit cost budgetary procedure while Tennessee and Pennsylvania are currently developing unit cost computer capabilities. Washington and Missouri have no systematic approaches to the development of unit costs but do budget by program goals and workload indicators.

The budget proposed by Texas for the 1976-1977 biennium is a zero-based budget submission as contrasted with an incremental budget. Agency program managers prepare activity decision packages and program decision packages. Each set of activity and program packages is ranked by priority and all operations within each package are identified in the budget request. This technique highlights service and product results of varying levels of expenditure.

The Pennsylvania Bureau of State Parks, in collaboration with the Pennsylvania State University is developing a unit costing technique through the allocation of operational costs on

17 recreational activities. Cost allocations are used to provide the activity days per unit of facility, the operations and maintenance costs per unit, and the operation and maintenance costs per activity day of usage by unit. The resulting information is used to critique operations at the park level and to assist in budget preparation and long-range planning.

The Tennessee Wildlife Resources Agency currently has no unit cost procedures but is working on a comprehensive wildlife plan to include unit costs and regional program package budgeting by Fiscal Year 1975-1976.

D. Payments in Lieu of Taxes

1. Federal

The USFS distributes 25% of all revenue earned from the sale of forest products or the use of National Forest and National Grassland land to the states where the National Forests are located to be used for county schools and roads.

There are only two instances where the NPS, as authorized by a special act of Congress, makes payments to local governments.

The BLM makes payments from the receipts for the use of the public domain for grazing, mining, forestry and from the sale of land to local governments in lieu of taxes under a variety of legislative provisions. Special state situations exist in Alaska, and the revested lands in Oregon and California.

The USF&WS has one in lieu tax payment derived from the sale of products from the national wildlife refuge system.

Other USF&WS payments to states are really grants-in-aid for the acquisition of migratory bird refuges and waterfowl production areas, support of fish restoration and management projects, and for the acquisition and development of land and water areas for wildlife management research.

The TVA has an extensive system of in lieu payments to state and local governments but it is expressly associated with power program rather than the recreational program. Five percent of TVA's gross proceeds from the sale of power (except sales to the Federal Government) is paid to states and counties by TVA as payments in lieu of taxes. The states are free to distribute these payments as they see fit. Local distributors of TVA power also pay taxes or tax equivalents to state and local governments under various state laws.

The BuRec has no general statutory obligation or administrative policy concerning payments to local governments in lieu of taxes. However, at least three projects (Columbia Basin Project, Klamath Project, and the Trinity Division of the Central Valley Project) have special provisions in their authorizations for payments in lieu of taxes.

2. State

The state agencies studied typically make in lieu tax payments on forest croplands and park lands.

Most states include revenue for payments in lieu of taxes in their budget requests. Only Tennessee and Texas have special funds for these payments. The Texas fund must be reimbursed by the Federal government from fish and wildlife restoration funds, whereas Tennessee makes its payments from a fund made up of license payments, sale of contraband, fines,

penalties, and forfeitures used for administrative expenses and for the purchase of land suitable for the efficient management of wildlife.

The Washington State Parks and Recreation Commission has no provisions for payments to local governments in lieu of taxes.

The Texas Parks and Wildlife Commission has authorized payments in lieu of taxes to counties and school districts.

Prior to 1964, Pennsylvania had two provisions for payments in lieu of taxes: $0.20/acre on state forest lands transferred into the park system and $0.20/acre on the total amount of forest lands. In 1964, Pennsylvania added a $0.20/acre payment for park lands.

The Tennessee Wildlife Resources Agency has no statutory provision relating to payments in lieu of taxes. However, the authority to acquire lands has been administratively interpreted to include acquisitions of tax delinquent lands.

The Missouri Conservation Commission as provided by state law, pays $0.35/acre to the county for all state and private lands classified as Federal Croplands within the county. These funds are appropriated annually by the Legislature from general revenue sources.

The Minnesota Department of Natural Resources has no payments in lieu of taxes provision on property acquired by the state. Minnesota law requires that all assessments and taxes due at the time of acquisition be paid as taxes. If the state permits occupation of the property through a rental agreement, 30% of the rental received is returned to the local government in lieu of property taxes.

E. Fees

1. Federal

The authorization for and the extent of admission and recreation use fees at Federal projects is contained in the Land and Water Conservation Fund Act of 1965, as amended. In its present form, admission fees can be charged only at designated units of the NPS administered by the Department of the Interior and those National Recreation Areas administered by the Department of Agriculture.

NPS entrance fees may be Golden Eagle Passports ($10.00/year), Golden Age passports (free entrance to citizens over the age of 62), or park admissions fees which average $1.00 per day. National Recreation Area admission fees are not charged at all areas; if they are charged, the fee is minimal.

The Land and Water Conservation Fund Act stipulates that Federal agencies furnishing specialized outdoor recreation facilities, equipment, or services can charge user fees subject to specific criteria.

When setting rates for recreation areas the USFS Regional Foresters consider the direct and indirect cost to the United States for developing and operating the area, the cost charged for private and other public facilities in the vicinity, the quality and variety of recreational opportunities in the area, and state, local and private contributions to maintaining and developing the area. The USFS establishes user fees at levels comparable to rates justified by private investments in the same vicinity. Concession fees are also determined on the basis of prevailing private and commerical rates charged in the area.

The NPS concession fees are based on a franchise fee formula promulgated under the Concessions Policies Act which directs that they "be judged primarily by comparison with those current for facilities and services of comparable character under similar conditions..."

BLM user fees are determined by the state director who is the line manager for 11 western states and Alaska. BLM user fees are charged according to the sophistication of the facilities. Concessioners may establish changes at a comparable level with that of private facilities in the vicinity.

The USF&WS may establish reasonable charges and fees for public use of national wildlife refuges, game refuges, national fish hatcheries and other conservation areas.

TVA has no user charges. Concessioners charge rates comparable to rates charged by private facilities in the vicinity.

The BuRec has no recreation fee schedule for the 18 areas that it administers. The Fontennelle Reservoir of the Seedskadee Project in Wyoming is the only one with recreation facilities approaching those specified in the Land and Water Conservation Fund Act. This reservoir is being studied to determine if user fees should be charged.

2. State

State fees are often lower than those charged by private investors. Many states, including Tennessee, are considering raising their fees. Texas is the only state that charges entrance fees to state parks. These funds go into the Texas Park Development Fund for acquiring and developing lands as state parks.

F. Authorities to Acquire Land for Recreation, Fish and Wildlife Management

1. Federal

Federal agencies may generally use Land and Water Conservation Funds for the acquisition of land and the development of recreational sites. In addition, most authorizing legislation contains authority for the acquisition of lands. The NPS, TVA and the BuRec may have authorization to acquire lands in the general description of the park or project areas.

Federal authorities for land acquisition include:

a) USFS: Weeks Act of 1911 which allows the government to purchase and exchange lands for national forests.

b) NPS: No general authority exists to acquire or dispose of park lands. Authorities for land acquisition and disposal are contained in the specific legislation for each area in the system.

c) BLM: No explicit authority to acquire land for recreation.

d) USF&WS: The Fish and Wildlife Act of 1956 directs the Secretary of the Interior to acquire refuge lands. The Migratory Bird Hunting Stamp Act authorizes acquisition of waterfowl production areas. The Refuge Recreation Act authorizes acquisition of lands adjacent to existing conservation areas for recreational development and to protect the natural resources of the refuge.

e) TVA: Recreation was not specified as a major purpose of TVA programs at the time of authorization, but the acquisition of specific project lands may include authorizations for recreation.

f) BuRec: No general authority for recreation and fish and wildlife programs although recreation and fish and wildlife considerations are a part of individual project authorization.

2. State

State authorities for the acquisition of land for recreation, fish and wildlife purposes are more explicit than the Federal authorities. States may institute condemnation proceedings in order to acquire lands. The specific authorities are as follows:

a) Washington State Parks and Recreation Commission: The general powers and duties of the Commission, as set forth in Section 43.51.040, RCW, include a broad grant of authority to acquire land for park and parkway purposes either by purchase or by condemnation.

b) Texas Parks and Wildlife Commission: The Land and Water Conservation Act (Chapter 112, 1965 Regular Session) provides the basic authority for the acquisition of land for recreation purposes to construct and maintain facilities, or to enter into agreements with any other agency to construct, maintain and operate facilities.

c) Pennsylvania Bureau of State Parks: The Bureau of State Parks, through the Department of Environmental Resources is given specific powers (in Section 1906-A, (2), Act No. 275, December 3, 1970) to acquire natural areas or other areas with unique features by purchase, lease, or condemnation provided that the amount expended for acquisition does not exceed the amount specifically appropriated for such purposes and that mineral rights, rights-of-way, and other encumbrances are not inconsistent with recreation purposes.

d) Tennessee Wildlife Resources Agency: Public Acts of 1974, Section 5, provides authority to acquire areas, and fish hatcheries. Lands can also be acquired by gift, condemnation, or lease.

e) The Missouri Conservation Commission: Empowered to acquire land by purchase, gift, eminent domain, or otherwise for the control, management, restoration, conservation, and regulation of the bird, fish, game, forestry, and wildlife resources of the State. There is no stated authority to acquire land for recreation purposes except as related to the above authority.

f) The Minnesota Department of Natural Resources: General authority to carry out recreational projects and acquire interests in land is included in the basic laws. Specific authority is included in the legislation creating each

park. If power of eminent domain is not granted, and if the land cannot be acquired by other means, another legislative enactment is required authorizing condemnation.

G. Authority and Procedure for Leasing Land and/or Facilities to Individuals

1. Federal

The USFS is authorized to issue special use permits (with long term leases) for a wide range of purposes including agriculture, community uses, public and private recreational uses, industrial uses, public information research, study and training, transportation, utilities and communications, and water. Another set of term permits is limited to a maximum of 80 acres and 30 years duration and applies solely to National Forest lands. Term permits for the use of structures or improvements under the administrative control of the USFS are limited to 30 years.

USFS concessions come under the aegis of special use permits. Current USFS policy discourages expansion of present long-term residential occupancy of sites on national forest system lands. Approximately 18,000 recreation residence sites on Federal land have been occupied continuously for extended periods. The residential special permits and all other licenses may be terminated only if the land is needed for a higher use (discretion of the USFS) or breach of permit terms.

NPS has a basic authority to lease or permit the use of land for the accommodation of visitors in the various parks, monuments, and other reservations for a period not exceeding 30 years. The 378 operating concession activities include restaurants, snack bars, lodging, camp-grounds and related facilities, trailer parks, general merchandising, souvenirs and curios, marinas and tackle shops, and transportation.

The NPS is authorized to negotiate concession contracts without soliciting bids, however, a prospectus is normally issued for the information of all persons known to be interested in providing that particular type of concession. When the NPS determines that concession facilities should be built, a bidding procedure is used that begins with a prospectus that clearly delineates NPS requirements. NPS also has the authority to permit a "possessory interest", i.e., "all incidents of ownership except legal title," in concession facilities under the Concession Policies Act, PL 89-249 79 Stat. 969). NPS has the authority to terminate a concession permit with prior warning if the permittee has not met NPS standards.

The USF&WS may issue permits for public recreational use in national wildlife refuges only if the public recreational use does not interfere with the primary purpose for which the area was established and if funds are available for the development, operation, and maintenance of the permitted forms of recreation. The permitted recreational uses, usually operated by concessioners, are boat rentals, campgrounds, trailer hookups, and marinas.

The TVA has no formalized concession policy. There are only seven areas with activities considered by TVA to be concessions, each is primarily a marina. The TVA policy for permits, leases, and permanent recreational easements involve negotiated sales to private owners who then make substantial investments. Currently TVA has leases and permits for the following uses:

Agriculture - 1,100
Public Parks - 75
Private docks and resorts - 65
Wildlife - 9 + 41 separate permits

All TVA leases are made for 30 years and are revocable.

BuRec has no statutory authority for leasing land although the Secretary of the Interior may adopt such methods as he deems to be in the best interest of the United States and the project. Most BuRec project areas are administered by other agencies (233 out of 251). Twenty-one of the leases are under current Federal Water Project Recreation Act (PL 89-72) cost sharing agreements for recreation and fish and wildlife.

2. State

State agencies typically grant leases and permits for recreational and educational facilities in state parks or for mining, grazing, or farming of undeveloped state lands.

The Washington State Parks and Recreation Commission has three types of leases - concessions in state parks, individual leasing of undeveloped parks, and leasing of land to television stations. All leases are subject to conditions approved by the Commission. Park concessioners must generally provide for public access. These leases are usually for periods not longer than 20 years with the exception of special high investment cases. Individual leases of undeveloped land for grazing, agriculture or mineral development do not exceed 10 years.

The Texas Parks and Wildlife Commission grants park concessions under two policies: if the net investment is less

than $15,000, the lease may not exceed three years; if net investment is greater than $15,000, leases are negotiable up to five years. The Commission may also lease grazing rights and harvest and sell or to sell in place any timber, hay or other product grown on such lands when these products are found to be in excess of wildlife needs.

The Pennsylvania Bureau of State Parks will lease a portion of any state park, whether owned or leased by the Commonwealth, as a site for buildings and facilities to be used for health, recreational, or educational purposes, or for parking areas and concessions for the convenience and comfort of the public. The term of the leases may not exceed 10 years unless a substantial capital investment is involved and it is deemed in the best interests of the Commonwealth to extend the term of the lease to 35 years. Mining leases grant rights to mine or remove any oil or gas found in a state park. These resources may be mined if it is considered to be in the best interests of the state. Beginning in 1913, the state forest system leased 1/4 acre lots to individuals and permitted the construction of hunting cabins. No new leases have been granted since 1970 but many of the existing leases have followed the reclassification of state forests to state parks. Pennsylvania has no written concessions policy but the concessions that exist, most of which are associated with three ski areas, involved a bidding process.

Tennessee does not lease lands to any state, local or private agency. The state will, however, lease or lend to, sell or exchange land with the Secretary of the Interior for

wildlife refuges under the authorities of the Migratory Bird Treaty Act and the Migratory Bird Conservation Act. Tennessee will lease lands from any governmental agency or private individual to obtain exclusive game and fish rights and for the right to manage the areas. Leases from Federal agencies typically run 99 years at a cost of $1.00. The state acquires game and fish rights from private owners for any mutually agreeable period. The Wildlife Resources Agency may sublet the rights secured from private individuals to any other public agency of the state or Federal government for management purposes, but has not done so except for cooperative fishing, hunting, or trapping.

The Missouri Conservation Commission has no specific authority for leasing land or facilities to private individuals. The Commission may enter into sharecrop type arrangements with farmers as long as the use is compatible with the goals of the Commission. The terms of agreement are negotiated by the field staff. Missouri has a standard concessions contract but the Commission has difficulty acquiring concessions because the business activity level is not generally high enough to support large, long term investments. Fewer than 10 concessioners are operative, primarily for boat rentals, and the total income for FY 1973 was less than $15,000.

Minnesota Department of Natural Resources leases have a renewable ten year term with a three month concellation notice clause, under an authority which includes leasing for taking and removing sand, gravel, clay, rock, marl, peat, and black dirt. A second authority is limited to lands and buildings not presently needed to meet Department objectives. These

leases must be made in "furtherance of the interests of conservation", are for a two year term, and include cooperative farming agreements. A special type of lease called the "Lakeshore Leasing Law" subdivides land into convenient lot sizes and then leases them for cottage and camp purposes for not more than 10 years at a time. The Department does not have a standard concessions policy.

H. Findings

1. Federal

a. The six Federal agencies studied were created for specific and limited purposes. Recreation was initially a by-product of their original purposes, including the National Park Service which was originally established "to promote and regulate the use of national parks, monuments, and reservations, for the purpose of conserving the scenery, the natural and historic objects and the wildlife..."

b. Actual unit cost data were not generally available for the operating land management agencies. The Department of the Interior recreation and fish and wildlife bureaus and services use incremental budgeting for program enhancement and have not developed unit costing. It is possible to take the number of visitors, or visitor days, and the total cost of operation of a given recreation area and compute a cost per recreation day. This cost can then be used to project future costs based on projected utilization factors, but most agencies were concerned about the reliability of such a technique. This technique assumes all variables, other than dollars and recreation days, remain constant.

c. The 1973 Nationwide Outdoor Recreation Plan sets forth outdoor recreation facility cost estimates for selected activities. Operating costs based on an optimum staffing allocation are also estimated per unit of recreation. No record was found of direct application of the data to the incremental units of increased costs for recreation activities in any land management bureaus and services.

USFS does not have unit cost data at the central office in Washington. Forest Supervisors have developed empirical data on the costs of various activities and these data generally form a basis for evaluating cost estimates from each national forest. It is recognized that costs very from forest to forest, and there are no figures that are applicable nation wide.

d. A continuing review of land use for recreation (more so than fish and wildlife enhancement) is being conducted by the National Conference on State Parks of the National Recreation and Parks Association. The Council on Environmental Quality has sponsored a related study on recreational use of water supply reservoirs; and the American Society of Planning Officials has sponsored an effort by Professor Richard Ragatz, to evaluate recreation homes.

e. Neither the authority for their creation, their administrative procedures and practices, nor their budgetary resources would indicate that the six Federal land management agencies studied have a mission which is broad enough to encompass the wide-ranging water resource related recreation and fish and wildlife enhancement activities of WRDPs presently under the stewardship of the Corps.

2. State

a. The six state agencies studied range from those which administer only recreation (Pennsylvania Bureau of State Parks) or fish and wildlife (Tennessee Wildlife Resources Agency) to those which administer multiple purpose activities including parks and fish and wildlife (Minnesota Department of Natural Resources).

b. General findings indicate that the rate of state level increase in these activities has not kept pace with the overall rate of economic growth within the states. In some instances, this has been attributed to the failure of sources of dedicated revenue to match needed expenditures. Missouri, Tennessee and Texas are states with a high level of dedicated revenue. Washington State recently abandoned dedicated revenues as the primary means of financing their activities. In other instances, the slower rate of growth for recreation and fish and wildlife enhancement purposes is simply attributed to the general extension of state involvement in other social programs and a re-establishment of priorities with a fixed level of limited resources. The validity of this finding is difficult to verify at the individual agency level because of differing economic bases and varying rates of growth for each state. It is, however, the general concensus of responsible state officials, and is documented at the aggregate level by the Bureau of Census in Topical Studies, Volume 6, Number 4 of the 1972 Census of Governments, issued December 1974.

c. Certain specific findings may be of use to the Corps in refining its own techniques of resource allocation and the enhancement of recreation and fish and wildlife opportunities:

(1) The Texas Parks and Wildlife Commission has begun zero-base budgeting for all activities beginning with the FY 1976-78 biennium. Contrasted to incremental budgeting, this technique requires each activity to be justified anew in each budget cycle rather than merely justifying increases beyond the prior budget. For Texas, this appears to have resulted in identifying varying levels of expenditure and the service or product results of each.

(2) The Pennsylvania Bureau of State Parks is developing, and has under pilot operation at the Pennsylvania State University, a program for allocating operational costs to 17 recreational activities. The experimental uses of this technique have been to critique operations at the park level, to assist in annual budget preparation, and to assist in long range planning.

(3) The Washington State Parks and Recreation Commission has issued rules and regulations defining the "possessory interest" of concessioners in certain facilities on state lands. "Possessory interest" is defined as "... all incidents of ownership except the right to free transfer of mortgage and legal title,..." The possessory interest is subject to provisions of the contract, state laws, and regulations relating to the area. The possessory interest may be used as security for a loan or it may be assigned, transferred,

or relinquished prior to the expiration or termination of a contract with the prior approval of the Commission. The regulations provide further that the possessory interest shall not be extinguished by the expiration or other termination of the concession contract and may not be taken for public use or transferred to a successor without just compensation. This concept has not been in effect for a sufficiently long period to establish its value in encouraging recreational investments or relieving the state of recreational investment responsibilities. It appears to offer an opportunity for the use of private capital to serve a public purpose. A similar concept to provide concessioner security was incorporated in the statutory authority for the NPS in 1965.

CHAPTER 5

NATIONAL RECREATION, FISH AND WILDLIFE ENHANCEMENT NEEDS

This Chapter presents a statement of national outdoor recreation and fish and wildlife enhancement needs. First a generalized forecast of the demands for selected types of outdoor activities is made. This is followed by findings of Congressionally authorized Commissions and references to specific legislative acts which provide an authoritative indication of public policy in this general area. Finally, the degree to which the Corps WRDP land contributes to both satisfying the projected demands for outdoor activity and stated public policy is identified.

A. Generalized Outdoor Recreation Demands Forecast

A methodology was formulated for projecting the demands for land and water area associated with selected outdoor recreation activities normally found on Corps WRDP land. Major elements of this methodology are briefly summarized below.

First, resident populations for 1970 and 1980 by major geographic regions and distribution by income class were obtained from the National Planning Association (NPA) Regional Demographic Projection Series[a] and Regional Economic Projection Series[b] and are shown in Tables 5-1 through 5-4.

---

[a]National Planning Association. 1972. Regional Demographic Projections: 1960-1985. Washington, D. C.

[b]National Planning Association. 1973. Regional Economic Projections: 1960-1985. Washington, D. C.

Table 5-1. Resident Population Over 9 Years of Age by Region, 1970 and 1980 (In Thousands of Persons)

NPA REGIONS	1970	1980
NEW ENGLAND	9,733.6	10,936.2
MIDDLE ATLANTIC	35,061.0	38,860.9
GREAT LAKES	32,772.8	36,518.4
SOUTHEAST	35,848.1	40,698.5
PLAINS	13,396.9	14,294.0
SOUTHWEST	13,477.2	15,512.0
MOUNTAINS	4,066.9	4,699.4
FAR WEST	22,226.8	26,276.9
U.S.A.	166,583.3	187,796.3

Source: National Planning Association. 1973. Regional Demographic Projections: 1960-1985. Washington, D.C. Adjusted to maintain internal consistency.

Table 5-2. Distribution of Population by Income Size Class of Families by Region, 1970 and 1980

(In Percent of Total Population)

NPA REGIONS	1970 Under 3,000	3 to 5,999	6 to 8,999	9 to 11,999	12 to 14,999	15 to 24,999	25,000 and Over	1980 Under 3,000	3 to 5,999	6 to 8,999	9 to 11,999	12 to 14,999	15 to 24,999	25,000 and Over
NEW ENGLAND	5.8	10.6	16.1	20.7	17.0	22.5	7.3	2.7	4.3	5.6	6.8	8.4	35.4	36.8
MIDDLE ATLANTIC	6.5	11.0	15.9	19.0	15.9	23.2	8.5	3.0	4.2	5.5	6.4	7.9	31.8	41.2
GREAT LAKES	7.2	11.4	17.0	21.2	16.7	20.8	5.7	3.2	5.2	6.1	7.2	9.0	36.3	33.0
SOUTHEAST	14.6	19.3	20.4	17.8	11.6	12.5	3.8	6.3	9.1	10.0	10.7	11.0	31.1	21.8
PLAINS	9.6	15.5	18.9	19.9	14.5	16.7	4.9	3.6	6.5	7.8	8.5	9.5	34.0	30.1
SOUTHWEST	11.7	17.3	19.4	18.2	13.0	15.6	4.8	5.2	8.3	9.4	10.3	11.0	32.1	23.7
MOUNTAINS	8.3	14.9	20.2	20.6	14.5	16.7	4.8	3.9	6.6	8.4	9.9	11.8	35.3	24.1
FAR WEST	7.0	11.8	15.0	18.1	17.1	23.0	8.0	3.4	5.3	6.7	7.5	7.5	33.7	35.9

Source: National Planning Association. 1973. Regional Demographic Projections: 1960-1985. Washington, D. C. Adjusted to maintain internal consistency.

Table 5-3. Distribution of Population by Income Size Class of Families by Region, 1970

(In Thousands of Persons)

NPA REGIONS	Under 3,000	3 to 5,999	6 to 8,999	9 to 11,999	12 to 14,999	15 to 24,999	25,000 and Over
NEW ENGLAND	564.55	1,031.76	1,567.11	2,014.86	1,654.71	2,190.06	710.55
MIDDLE ATLANTIC	2,278.97	3,856.71	5,574.70	6,661.59	5,574.70	8,134.15	2,980.19
GREAT LAKES	2,359.64	3,736.10	5,571.38	6,947.83	5,473.06	6,816.74	1,868.05
SOUTHEAST	5,233.82	6,918.68	7,313.01	6,380.96	4,158.38	4,481.01	1,362.23
PLAINS	1,286.10	2,076.52	2,532.01	2,665.98	1,942.55	2,237.28	656.45
SOUTHWEST	1,576.83	2,331.56	2,614.58	2,452.85	1,752.04	2,102.44	646.91
MOUNTAINS	337.55	605.97	821.51	837.78	589.70	679.17	195.21
FAR WEST	1,555.88	2,622.76	3,334.02	4,023.05	3,800.78	5,112.16	1,778.14
U.S.A.	15,193.34	23,180.06	29,328.32	31,984.90	24,945.92	31,753.01	10,197.73

Source: Tables 5-1 and 5-2

Table 5-4. Distribution of Population by Income Size Class of Families by Region, 1980

(In Thousands of Persons)

NPA REGIONS	Under 3,000	3 to 5,999	6 to 8,999	9 to 11,999	12 to 14,999	15 to 24,999	25,000 and Over
NEW ENGLAND	295.28	470.26	612.43	743.66	918.64	3,871.41	4,024.52
MIDDLE ATLANTIC	1,165.83	1,632.16	2,137.35	2,487.10	3,070.01	12,357.77	16,010.69
GREAT LAKES	1,168.59	1,898.96	2,227.62	2,629.32	3,286.66	13,256.18	12,051.07
SOUTHEAST	2,564.01	3,703.56	4,069.85	4,354.74	4,476.84	12,657.23	8,872.27
PLAINS	514.58	929.11	1,114.93	1,214.99	1,357.93	4,859.96	4,302.49
SOUTHWEST	806.62	1,287.50	1,458.13	1,597.74	1,706.32	4,979.35	3,676.34
MOUNTAINS	183.28	310.16	394.75	465.24	554.53	1,658.89	1,132.56
FAR WEST	893.41	1,392.68	1,760.55	1,970.77	1,970.77	8,855.32	9,433.41
U.S.A.	7,591.60	11,624.39	13,775.61	15,463.56	17,341.70	62,496.11	59,503.35

Source: Tables 5-1 and 5-2

National Planning Association regional projections are the only projections available in the U. S. that contain forecasts of income by income-class. Income is one of the cardinal determinants of outdoor recreation participation rates.

The Regional Economic Projections Series is published annually, and contains 5 and 10 year forecasts of metropolitan, state and regional population, employment, household and family formation, personal income, and consumption. Emphasis is placed upon estimating future patterns of interstate migration and industrial location.

Whenever possible, population projections prepared by the National Planning Association have been drawn from work in this area by the Bureau of the Census.

To provide population projections NPA employed the standard cohort survival method on a five-year basis vital statistics (fertility and survival rates). These statistics were calculated by assuming that such rates will bear the same relationship to the corresponding rates for the whole population as occurred in the most recent Census data. In all population projections the Census Series E fertility assumption has been used which most closely fits recent experience and which is also used by most recent U. S. Government projections.

The National Planning Association's projections were derived by using the macro-economic and industry models built by Michael K. Evans and his associates at Chase Econometrics Associates among others.

The projections for consumption and investment by detailed commodity types are produced by the models built at the National Planning Association.

The NPA regions consist of the following states:

New England: Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, and Connecticut.

Middle Atlantic: New York, New Jersey, Pennsylvania, Delaware, Maryland, and District of Columbia.

Great Lakes: Ohio, Indiana, Illinois, Michigan, and Wisconsin.

Southeast: Virginia, West Virginia, Kentucky, Tennessee, North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, and Arkansas.

Plains: Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, and Kansas.

Southwest: Oklahoma, Texas, Arizona, and New Mexico.

Mountains: Montana, Idaho, Wyoming, Utah, and Colorado.

Far West: Washington, Oregon, and California.

Since the NPA income size distribution did not directly correspond to the income size distribution used by BOR, these were aggregated to make the NPA series compatible with BOR. Participation rates for each of seven income class sizes were obtained from BOR[a]. Those obtained were for boating, swimming, hunting, camping, picnicking, and fishing (Tables 5-5 through 5-10).

[a]Unpublished data from BOR 1970 Survey of Recreation.

Table 5-5. Annual Participation Rates in Boating by Income Size Class by Region

(Rate expressed as percentage of population over 9 years of age)

NPA REGIONS	Under 3,000	3 to 5,999	6 to 8,999	9 to 11,999	12 to 14,999	15 to 24,999	25,000 and Over
NEW ENGLAND	11.5	15.9	28.4	36.7	36.7	35.4	45.7
MIDDLE ATLANTIC	5.4	12.4	18.6	28.5	28.5	35.0	44.5
GREAT LAKES	7.3	18.9	22.9	35.1	35.1	42.9	51.4
SOUTHEAST	5.1	12.4	20.8	28.3	28.3	37.6	48.4
PLAINS	12.2	15.8	32.0	43.2	43.2	43.4	49.8
SOUTHWEST	4.9	14.3	24.0	35.6	35.6	37.3	59.0
MOUNTAINS	5.3	19.2	22.7	40.0	40.0	27.3	62.2
FAR WEST	12.2	16.1	23.6	30.9	30.9	36.7	41.5

Source: Calculated from unpublished material from BOR 1970 Survey of Recreation.

Table 5-6. Annual Participation Rates in Swimming by Income Size Class by Region

(Rate expressed as percentage of population over 9 years of age)

NPA REGIONS	Under 3,000	3 to 5,999	6 to 8,999	9 to 11,999	12 to 14,999	15 to 24,999	25,000 and Over
NEW ENGLAND	23.9	45.1	61.3	71.5	71.5	67.6	70.7
MIDDLE ATLANTIC	15.9	30.4	48.2	65.0	65.0	68.5	73.9
GREAT LAKES	15.6	32.8	45.6	58.7	58.7	64.8	64.3
SOUTHEAST	14.9	29.0	42.1	58.5	58.5	64.9	64.9
PLAINS	18.2	29.2	48.3	55.9	55.9	71.4	56.9
SOUTHWEST	13.1	26.0	46.6	54.6	54.6	59.2	64.2
MOUNTAINS	25.5	33.4	49.4	55.9	55.9	53.9	73.0
FAR WEST	23.0	38.2	47.6	55.3	55.3	63.9	74.7

Source: Calculated from unpublished material from BOR 1970 Survey of Recreation.

Table 5-7. Annual Participation Rates in Hunting by Income Size Class by Region

(Rate expressed as percentage of population over 9 years of age)

NPA REGIONS	Under 3,000	3 to 5,999	6 to 8,999	9 to 11,999	12 to 14,999	15 to 24,999	25,000 and Over
NEW ENGLAND	5.2	7.7	10.3	8.9	8.9	4.9	0.1
MIDDLE ATLANTIC	3.5	7.6	10.0	8.0	8.0	5.5	3.4
GREAT LAKES	5.6	11.1	14.4	11.9	11.9	12.0	6.7
SOUTHEAST	6.2	11.1	12.9	13.2	13.2	11.1	5.2
PLAINS	10.7	17.7	21.1	24.6	24.6	19.7	10.3
SOUTHWEST	9.2	18.3	21.9	19.4	19.4	24.0	22.1
MOUNTAINS	8.4	11.7	18.8	29.7	29.7	12.5	35.1
FAR WEST	8.3	8.1	10.9	11.3	11.3	12.1	13.8

Source: Calculated from unpublished material from BOR 1970 Survey of Recreation.

Table 5-8. Annual Participation Rates in Camping by Income Size Class by Region

(Rate expressed as pecentage of population over 9 year of age)

NFA REGIONS	Under 3,000	3 to 5,999	6 to 8,999	9 to 11,999	12 to 14,999	15 to 24,999	25,000 and Over
NEW ENGLAND	9.0	9.8	23.9	24.5	24.5	22.1	21.7
MIDDLE ATLANTIC	4.5	9.0	13.4	15.3	15.3	13.1	14.8
GREAT LAKES	5.8	13.1	22.0	26.5	26.5	28.4	21.6
SOUTHEAST	4.1	10.1	17.2	22.5	22.5	22.0	12.0
PLAINS	11.1	14.4	28.8	34.4	34.4	30.3	23.8
SOUTHWEST	8.0	18.7	29.9	31.9	31.9	33.2	25.7
MOUNTAINS	14.3	28.0	38.0	54.7	54.7	33.6	41.1
FAR WEST	18.8	25.5	32.4	38.8	38.8	46.7	23.9

Source: Calculated from unpublished material from BOR 1970 Survey of Recreation.

Table 5-9. Annual Participation Rates in Picnicking by Income Class by Region

(Rate expressed as percentage of population over 9 years of age)

NPA REGIONS	Under 3,000	3 to 5,999	6 to 8,999	9 to 11,999	12 to 14,999	15 to 24,999	25,000 and Over
NEW ENGLAND	28.4	42.4	54.7	59.9	59.9	54.4	35.9
MIDDLE ATLANTIC	22.8	39.0	52.2	59.8	59.8	51.1	50.4
GREAT LAKES	31.4	46.8	54.8	63.7	63.7	59.2	56.2
SOUTHEAST	19.6	30.6	46.5	56.3	56.3	55.1	35.1
PLAINS	32.6	55.2	65.5	65.9	65.9	67.3	48.8
SOUTHWEST	19.3	29.5	50.2	53.2	53.2	49.1	40.4
MOUNTAINS	37.6	50.4	65.6	66.6	66.6	53.1	58.9
FAR WEST	30.2	40.1	55.3	60.8	60.8	60.9	49.1

Source: National Planning Association. 1973. Regional Demographic Projections: 1960-85

Table 5-10. Annual Participation Rates in Fishing by Income Class by Region

(Rate expressed as percentage of population over 9 years of age)

NPA REGIONS	Under 3,000	3 to 5,999	6 to 8,999	9 to 11,999	12 to 14,999	15 to 24,999	25,000 and Over
NEW ENGLAND	12.9	15.8	28.4	24.8	24.8	25.0	33.7
MIDDLE ATLANTIC	8.1	15.2	21.9	25.2	25.2	22.7	28.6
GREAT LAKES	14.0	25.8	28.4	32.9	32.9	31.8	24.0
SOUTHEAST	19.3	27.4	34.1	36.3	36.3	31.5	37.8
PLAINS	24.1	31.1	43.1	47.6	47.6	43.6	28.2
SOUTHWEST	19.2	31.8	43.6	42.5	42.5	43.1	43.0
MOUNTAINS	16.8	25.1	36.4	44.7	44.7	41.6	55.1
FAR WEST	17.4	24.7	33.0	33.1	33.1	41.1	21.4

Source: Calculated from unpublished material from BOR 1970 Survey of Recreation.

Multiplication of the regional populations by the participation rates resulted in estimates of numbers of participants in each region for 1970 and 1980. These are shown in Tables 5-11 through 5-22. The annual number of activity days per participant for each of the six recreation activities was obtained from BOR[a]. Multiplication of this number by the number of participants in each region resulted in the total number of recreation days for each of the six activities for 1970 and 1980, as shown in Tables 5-23, 5-25, 5-26, 5-28, 2-30, and 5-31.

In the case of boating, hunting, and camping, the total number of activity days was further subdivided: boating into marina based and trailered boats; hunting into small game, big game, and waterfowl hunting; and camping into trailer and tent camping.

Thus, a total of ten outdoor recreation categories are reported upon in this report. Other categories were considered: retail and service establishments and hotels and motels were deleted because it was not possible to separate recreation activity levels from levels attributable to other activities in these establishments; but in the case of marinas, harbors and swimming beaches the projected land use requirements include land areas improved by such establishments. Upland game, cold and warm water fishing, and wilderness and natural area categories were deleted because of a paucity of information.

---

[a]Unpublished data from BOR 1970 Survey of Recreation.

Table 5-11. Number of Participants in Boating by Income Size Class by Region, 1970

(In Thousands of Persons)

NPA REGIONS	Under 3,000	3 to 5,999	6 to 8,999	9 to 11,999	12 to 14,999	15 to 24,999	25,000 and Over	TOTAL
NEW ENGLAND	64.92	164.05	445.06	739.45	607.28	775.28	324.72	3,120.76
MIDDLE ATLANTIC	123.06	478.23	1,036.89	1,898.55	1,588.79	2,846.95	1,326.18	9,298.65
GREAT LAKES	172.25	706.12	1,275.85	2,438.69	1,921.04	2,924.38	960.18	10,398.51
SOUTHEAST	266.92	857.92	1,521.11	1,805.81	1,176.82	1,684.86	659.32	7,972.76
PLAINS	156.90	328.09	810.24	1,151.70	839.18	970.98	326.91	4,584.00
SOUTHWEST	77.26	333.41	627.50	873.2	623.73	784.21	381.68	3,701.00
MOUNTAINS	17.89	116.35	186.48	335.11	235.88	185.41	121.42	1,198.54
FAR WEST	189.92	422.26	786.83	1,243.12	1,174.44	1,876.16	737.93	6,430.56
U.S.A.	1,069.02	3,406.43	6,689.96	10,485.64	8,167.16	12,048.23	4,838.34	46,704.78

Source: Tables 5-3 and 5-5

Table 5-12. Number of Participants in Boating by Income Size Class by Region, 1980

(In thousands of Persons)

NPA REGIONS	Under 3,000	3 to 5,999	6 to 8,999	9 to 11,999	12 to 14,999	15 to 24,999	25,000 and Over	TOTAL
NEW ENGLAND	33.96	74.77	173.93	272.92	337.14	1,370.48	1,839.21	4,102.41
MIDDLE ATLANTIC	62.95	202.39	397.55	708.82	874.95	4,325.22	7,124.76	13,696.64
GREAT LAKES	85.31	358.90	510.12	922.89	1,153.62	5,686.90	6,194.25	14,911.99
SOUTHEAST	130.76	459.24	846.53	1,232.39	1,266.95	4,759.12	4,294.18	12,989.17
PLAINS	62.78	146.80	356.78	524.88	586.62	2,109.22	2,142.64	5,929.72
SOUTHWEST	39.52	184.11	349.95	568.80	607.45	1,857.30	2,169.04	5,776.17
MOUNTAINS	9.71	59.55	89.61	186.10	221.81	452.88	704.45	1,724.11
FAR WEST	109.00	224.22	415.49	608.97	608.97	3,249.90	3,914.87	9,131.42
U.S.A.	533.99	1,709.98	3,139.96	5,025.77	5,657.51	23,811.02	28,383.40	68,261.63

Source: Tables 5-4 and 5-5

9-5

Table 5-13. Number of Participants in Swimming by Income Size Class by Region, 1970

(In Thousands of Persons)

NPA REGIONS	Under 3,000	3 to 5,999	6 to 8,999	9 to 11,999	12 to 14,999	15 to 24,999	25,000 and Over	TOTAL
NEW ENGLAND	134.93	465.32	960.64	1,440.62	1,183.12	1,480.43	502.36	6,167.47
MIDDLE ATLANTIC	362.36	1,172.44	2,687.01	4,330.03	3,623.56	5,571.89	2,202.36	19,949.65
GREAT LAKES	368.10	1,225.44	2,540.55	4,078.38	3,212.69	4,417.25	1,201.16	17,043.57
SOUTHEAST	779.84	2,006.42	3,078.78	3,732.86	2,432.65	2,908.18	884.09	15,822.82
PLAINS	234.07	606.34	1,222.96	1,490.28	1,085.89	1,597.42	373.52	6,610.48
SOUTHWEST	206.56	606.21	1,218.39	1,339.2	956.61	1,244.64	415.32	5,986.99
MOUNTAINS	86.08	202.39	405.83	468.32	329.64	366.07	142.50	2,000.83
FAR WEST	357.85	1,001.89	1,586.99	2,224.75	2,101.83	3,266.67	1,328.27	11,868.25
U.S.A.	2,529.79	7,286.45	13,701.15	19,104.50	14,925.99	20,852.60	7,049.58	85,450.06

Source: Tables 5-3 and 5-6

Table 5-14. Number of Participants in Swimming by Income Size Class and Region, 1980

(In Thousands of Persons)

NPA REGIONS	Under 3,000	3 to 5,999	6 to 8,999	9 to 11,999	12 to 14,999	15 to 24,999	25,000 and Over	TOTAL
NEW ENGLAND	70.57	212.09	375.42	531.72	656.83	2,617.07	2,845.34	7,309.04
MIDDLE ATLANTIC	185.37	496.18	1,030.20	1,616.62	1,995.51	8,465.07	11,831.90	25,620.85
GREAT LAKES	182.30	622.86	1,015.79	1,543.41	1,929.27	8,590.00	7,748.84	21,632.47
SOUTHEAST	382.04	1,074.03	1,713.41	2,547.52	2,618.95	8,214.54	5,758.10	22,308.59
PLAINS	93.65	271.30	538.51	679.18	759.08	3,470.01	2,448.12	8,259.85
SOUTHWEST	105.67	334.75	679.49	872.37	931.65	2,947.78	2,360.21	8,231.92
MOUNTAINS	46.74	103.59	195.01	260.07	309.98	894.14	826.77	2,636.30
FAR WEST	306.40	532.00	838.02	1,089.84	1,089.84	5,658.55	7,046.76	16,460.49
U.S.A.	1,271.82	3,646.80	6,385.85	9,140.73	10,291.11	40,857.16	40,866.04	112,459.51

Source: Table 5-4 and 5-6

8-9

Table 5-19. Number of Participants in Hunting by Income Size Class and Region, 1970

(In Thousands of Persons)

NPA REGIONS	Under 3,000	3 to 5,999	6 to 8,999	9 to 11,999	12 to 14,999	15 to 24,999	25,000 and Over	TOTAL
NEW ENGLAND	29.36	79.45	161.41	179.32	147.27	107.31	00.71	704.83
MIDDLE ATLANTIC	79.76	293.11	557.47	532.93	445.98	447.38	101.33	2,457.96
GREAT LAKES	132.14	414.71	802.28	826.79	651.29	818.01	125.16	3,770.38
SOUTHEAST	324.50	767.97	943.38	842.29	548.91	497.39	70.84	3,995.28
PLAINS	137.61	367.54	534.25	655.83	477.87	440.74	67.61	2,681.45
SOUTHWEST	145.07	426.68	572.59	475.85	339.90	504.59	142.97	2,607.65
MOUNTAINS	28.35	70.90	154.44	248.82	175.14	84.90	68.52	831.07
FAR WEST	129.14	212.44	363.41	454.60	429.49	618.57	245.38	2,453.03
U.S.A.	1,005.93	2,632.80	4,089.23	4,216.43	3,215.85	3,518.89	822.52	19,501.65

Source: Table 5-3 and 5-7

Table 5-16. Number of Participants in Hunting by Income Size Class and Region, 1980

(In Thousands of Persons)

NPA REGIONS	Under 3,000	3 to 5,999	6 to 8,999	9 to 11,999	12 to 14,999	15 to 24,999	25,000 and Over	TOTAL
NEW ENGLAND	15.35	36.21	63.08	66.19	81.76	189.70	4.02	456.31
MIDDLE ATLANTIC	40.80	124.04	213.74	198.97	245.60	679.68	544.36	2,047.19
GREAT LAKES	65.44	210.78	320.78	312.89	391.11	1,590.74	807.42	3,699.16
SOUTHEAST	158.97	411.10	525.01	574.83	590.94	1,404.95	461.36	4,127.16
PLAINS	55.06	164.45	235.25	298.89	334.05	957.41	443.16	2,488.27
SOUTHWEST	74.21	235.61	319.33	309.96	331.03	1,195.04	812.47	3,277.65
MOUNTAINS	15.40	36.29	74.21	138.18	164.70	207.36	397.53	1,033.67
FAR WEST	74.15	112.81	191.90	222.70	222.70	1,071.49	1,301.81	3,197.56
U.S.A.	499.38	1,331.29	1,943.30	2,122.61	2,361.89	7,296.37	4,772.13	20,326.97

Source: Table 5-4 and 5-7

Table 5-17. Number of Participants in Camping by Income Size Class and Region, 1970

(In Thousands of Persons)

NPA REGIONS	Under 3,000	3 to 5,999	6 to 8,999	9 to 11,999	12 to 14,999	15 to 24,999	25,000 and Over	TOTAL
NEW ENGLAND	80.81	101.11	374.54	493.64	405.40	484.00	154.19	2,063.6
MIDDLE ATLANTIC	102.55	347.10	747.01	1,019.22	852.93	1,063.57	441.07	4,575.4
GREAT LAKES	136.86	489.43	1,225.70	1,841.17	1,450.36	1,935.95	403.50	7,482.9
SOUTHEAST	214.59	698.79	1,257.84	1,435.72	935.64	985.82	163.47	5,691.8
PLAINS	142.76	299.02	729.22	917.10	668.24	677.90	156.24	3,590.4
SOUTHWEST	126.15	436.00	781.76	782.46	558.90	698.01	166.26	3,549.54
MOUNTAINS	48.27	169.67	312.17	458.27	322.57	228.20	80.23	1,619.38
FAR WEST	292.51	668.80	1,080.22	1,560.94	1,474.70	2,387.38	424.98	7,889.53
U.S.A.	1,114.50	3,209.92	6,508.46	8,508.52	6,668.74	8,462.83	1,989.94	36,462.91

Source: Table 5-3 and 5-8

Table 5-18. Number of Participants in Camping by Income Size Class and Region, 1980

(In Thousands of Persons)

NPA REGIONS	Under 3,000	3 to 5,999	6 to 8,999	9 to 11,999	12 to 14,999	15 to 24,999	25,000 and Over	TOTAL
NEW ENGLAND	26.58	46.09	146.37	182.20	225.07	855.58	873.32	2,355.21
MIDDLE ATLANTIC	52.46	146.89	286.40	380.53	469.71	1,618.87	2,369.58	5,324.44
GREAT LAKES	67.78	248.76	490.08	696.77	870.96	3,764.76	2,603.03	8,742.14
SOUTHEAST	105.12	374.06	700.01	979.82	1,007.29	2,784.59	1,064.67	7,015.56
PLAINS	57.12	133.79	321.10	417.96	467.13	1,472.57	1,023.99	3,893.66
SOUTHWEST	64.53	240.76	435.98	509.68	544.32	1,653.14	944.82	4,393.23
MOUNTAINS	26.21	86.84	150.01	254.49	303.33	557.39	465.48	1,843.75
FAR WEST	167.96	355.13	570.42	764.66	764.66	4,135.43	2,254.58	9,012.84
U.S.A.	567.76	1,632.32	3,100.37	4,186.11	4,652.47	16,842.33	11,599.47	42,580.83

Source: Table 5-4 and 5-8

Table 5-19. Number of Participants in Picnicking by Income Size Class and Region, 1970

(In Thousands of Persons)

NPA REGIONS	Under 3,000	3 to 5,999	6 to 8,999	9 to 11,999	12 to 14,999	15 to 24,999	25,000 and Over	TOTAL
NEW ENGLAND	169.33	437.47	857.21	1,206.90	991.17	1,191.39	255.09	5,099.56
MIDDLE ATLANTIC	519.61	1,504.12	2,909.99	3,983.63	3,333.67	4,156.55	1,502.02	17,909.59
GREAT LAKES	740.93	1,748.49	3,053.12	4,425.77	3,486.34	4,035.51	1,049.84	18,540.00
SOUTHEAST	1,025.83	2,117.12	3,400.55	3,592.48	2,341.17	2,469.04	478.14	15,424.33
PLAINS	419.27	1,146.24	1,658.47	1,756.88	1,280.14	1,505.69	320.35	8,087.04
SOUTHWEST	304.33	687.81	1,312.52	1,304.92	932.09	1,032.30	261.35	5,835.32
MOUNTAINS	126.92	305.41	538.91	557.96	392.74	360.64	114.98	2,397.56
FAR WEST	469.88	1,051.73	1,843.71	2,446.01	2,310.87	3,113.31	873.07	12,108.58
U.S.A.	3,767.10	8,998.39	15,574.48	19,274.55	15,068.19	17,864.43	4,854.84	85,401.98

Source: Table 5-3 and 5-9

Table 5-20. Number of Participants in Picnicking by Income Size Class and Region, 1980

(In Thousands of Persons)

NPA REGIONS	Under 3,000	3 to 5,999	6 to 8,999	9 to 11,999	12 to 14,999	15 to 24,999	25,000 and Over	TOTAL
NEW ENGLAND	83.96	199.39	335.00	445.45	550.27	2,106.05	1,444.90	5,164.82
MIDDLE ATLANTIC	265.81	636.54	1,115.70	1,487.29	1,835.87	6,314.82	8,069.39	19,725.42
GREAT LAKES	366.94	888.71	1,220.74	1,674.88	2,093.60	7,847.66	6,772.70	20,865.23
SOUTHEAST	502.55	1,133.29	1,392.48	2,451.72	2,520.46	6,974.13	3,114.17	18,588.80
PLAINS	167.75	512.87	730.28	800.68	894.88	3,270.75	2,099.62	8,476.83
SOUTHWEST	155.68	379.81	731.98	850.00	907.76	2,444.86	1,485.24	6,955.33
MOUNTAINS	68.91	156.32	258.96	309.85	369.32	880.87	667.08	2,711.31
FAR WEST	269.91	558.46	973.58	1,198.23	1,198.23	5,392.89	4,631.80	14,223.00
U.S.A.	1,881.31	4,465.39	7,258.72	9,218.10	10,370.39	35,232.03	28,284.80	96,710.74

Source: Table 5-4 and 5-9

Table 5-21. Number of Participants in Fishing by Income Size Class and Region, 1970

(In Thousands of Persons)

NPA REGIONS	Under 3,000	3 to 5,999	6 to 8,999	9 to 11,999	12 to 14,999	15 to 24,999	25,000 and Over	TOTAL
NEW ENGLAND	72.83	163.02	445.06	499.69	410.37	547.52	239.46	2,377.95
MIDDLE ATLANTIC	184.60	586.22	1,220.86	1,678.72	1,404.82	1,846.45	852.33	7,774.00
GREAT LAKES	330.35	963.91	1,582.27	2,285.84	1,800.64	2,167.72	448.33	9,579.06
SOUTHEAST	1,010.13	1,895.72	2,493.74	2,316.29	1,509.49	1,411.52	514.92	11,151.81
PLAINS	309.95	645.80	1,091.30	1,269.01	924.65	975.45	185.12	5,401.28
SOUTHWEST	302.75	741.44	1,139.96	1,042.46	744.62	906.15	278.17	5,155.55
MOUNTAINS	56.71	152.10	299.03	374.49	263.60	282.53	107.56	1,536.02
FAR WEST	270.72	647.82	1,100.23	1,331.63	1,258.06	2,101.10	380.52	7,090.08
U.S.A.	2,538.04	5,796.03	9,372.45	10,798.13	8,316.25	10,238.44	3,006.41	50,065.75

Source: Table 5-3 and 5-10

Table 5-22. Number of Participants in Fishing by Income Size Class and Region, 1980

(In Thousands of Persons)

NPA REGIONS	Under 3,000	3 to 5,999	6 to 8.999	9 to 11,999	12 to 14,999	15 to 24,999	25,000 and over	TOTAL
NEW ENGLAND	38.09	74.30	173.93	184.43	227.82	967.85	1,356.26	3,022.68
MIDDLE ATLANTIC	94.43	248.09	468.08	626.75	773.64	2,805.21	4,579.06	9,595.26
GREAT LAKES	153.60	489.93	632.64	865.05	1,081.31	4,215.47	2,892.26	10,340.26
SOUTHEAST	494.85	1,014.78	1,387.82	1,580.77	1,625.09	3,987.03	3,353.72	13,444.06
PLAINS	124.01	288.95	480.54	578.34	646.37	2,118.94	1,213.30	5,450.45
SOUTHWEST	154.87	409.43	635.74	679.04	725.19	2,146.10	1,580.83	6,331.20
MOUNTAINS	30.79	77.85	143.69	207.96	247.88	690.10	624.04	2,022.31
FAR WEST	155.45	343.99	580.98	652.32	652.32	3,639.54	2,018.75	8,043.35
U.S.A.	1,256.09	2,947.32	4,503.42	5,374.66	5,979.62	20,570.24	17,618.22	58,249.57

Source: Table 5-4 and 5-10

Table 5-23. Number of Boating Days Per Participant, and Total Number of Boating Days by Region, 1970 and 1980

NPA REGIONS	No. of Days/ Participant	In Thousands	
		Total No. of Days 1970	Total No. of Days 1980
NEW ENGLAND	13.1	40,882	53,742
MIDDLE ATLANTIC	9.5	88,337	130,118
GREAT LAKES	10.7	111,264	159,558
SOUTHEAST	12.0	95,673	155,870
PLAINS	9.1	41,714	53,960
SOUTHWEST	9.5	35,160	54,874
MOUNTAINS	8.0	9,588	13,793
FAR WEST	9.7	62,376	88,575
U.S.A.	-	484,994	710,490

Source: Tables 5-11 and 5-12, and BOR 1970 Survey

Table 5-24. Number of Swimming Days Per Participant, and Total Number of Swimming Days by Region, 1970 and 1980

NPA REGIONS	No. of Days/ Participant	In Thousands	
		Total No. of Days 1970	Total No. of Days 1980
NEW ENGLAND	22.3	137,535	162,992
MIDDLE ATLANTIC	22.1	440,887	566,221
GREAT LAKES	21.1	359,619	456,445
SOUTHEAST	23.7	375,001	528,714
PLAINS	19.4	128,243	160,241
SOUTHWEST	16.6	99,384	136,649
MOUNTAINS	20.8	41,617	54,835
FAR WEST	30.8	365,542	506,983
U.S.A.	-	1,947,828	2,573,080

Source: Tables 5-13 and 5-14, and BOR 1970 Survey

Table 5-25. Number of Hunting Days Per Participant, and Total Number of Hunting Days by Region, 1970 and 1980

NPA REGIONS	No. of Days/ Participant	In Thousands	
		Total No. of Days 1970	Total No. of Days 1980
NEW ENGLAND	12.1	8,528	5,521
MIDDLE ATLANTIC	10.1	24,825	20,677
GREAT LAKES	9.8	36,950	36,252
SOUTHEAST	10.6	42,350	43,748
PLAINS	12.5	33,518	31,103
SOUTHWEST	9.4	24,512	30,810
MOUNTAINS	7.9	6,565	8,166
FAR WEST	11.0	26,983	35,173
U.S.A.	-	204,231	211,450

Source: Tables 5-15 and 5-16, and BOR 1970 Survey

Table 5-26. Number of Camping Days Per Participant and Total Number of Camping Days by Region, 1970 and 1980

NPA REGIONS	No. of Days/ Participant	In Thousands	
		Total No. of Days 1970	Total No. of Days 1980
NEW ENGLAND	13.9	28,685	32,737
MIDDLE ATLANTIC	13.0	59,481	69,218
GREAT LAKES	11.4	85,306	99,660
SOUTHEAST	10.3	58,626	72,260
PLAINS	10.6	38,059	41,273
SOUTHWEST	9.3	33,011	40,857
MOUNTAINS	10.0	16,194	18,438
FAR WEST	12.7	100,197	114,463
U.S.A.	-	419,559	488,906

Source: Tables 5-17 and 5-18, and BOR 1970 Survey

Table 5-27. Number of Picnicking Days Per Participant and Total Number of Picnicking Days by Region, 1970 and 1980

NPA REGIONS	No. of Days/ Participant	In Thousands	
		Total No. of Days 1970	Total No. of Days 1980
NEW ENGLAND	8.7	44,366	44,934
MIDDLE ATLANTIC	6.7	119,994	132,160
GREAT LAKES	6.6	122,364	137,711
SOUTHEAST	6.7	103,343	124,545
PLAINS	6.3	50,948	53,404
SOUTHWEST	5.6	32,678	38,950
MOUNTAINS	6.8	16,303	18,437
FAR WEST	7.0	84,760	99,561
U.S.A.	-	574,756	649,702

Source: Tables 5-19 and 5-20, and BOR 1970 Survey

Table 5-28. Number of Fishing Days Per Participant and Total Number of Fishing Days by Region, 1970 and 1980

In Thousands

NPA REGIONS	No. of Days/ Participant	Total No. of Days 1970	Total No. of Days 1980
NEW ENGLAND	12.4	29,487	37,481
MIDDLE ATLANTIC	10.6	82,404	101,710
GREAT LAKES	11.4	109,201	117,879
SOUTHEAST	12.6	140,513	169,395
PLAINS	11.1	59,954	60,500
SOUTHWEST	11.6	59,804	73,442
MOUNTAINS	9.8	15,053	19,819
FAR WEST	11.2	79,409	90,086
U.S.A.	-	575,825	670,312

Source: Tables 5-21 and 5-22, and BOR 1970 Survey

Table 5-29. Distribution of Total Number of Boating Days by Type of Boating by Region, 1970 and 1980

(In Thousands)

NPA REGIONS	Percent Marine Based	Percent Trailerd	Marine Based		Trailered	
			1970	1980	1970	1980
NEW ENGLAND	32%	68%	13,082	17,197	27,800	36,545
MIDDLE ATLANTIC	32%	68%	28,268	41,638	60,069	88,480
GREAT LAKES	32%	68%	35,604	51,059	75,660	108,499
SOUTHEAST	32%	68%	30,615	49,878	65,058	105,992
PLAINS	8%	92%	3,337	4,317	38,377	49,643
SOUTHWEST	8%	92%	2,813	4,390	32,347	50,484
MOUNTAINS	8%	92%	767	1,103	8,821	12,690
FAR WEST	36%	64%	22,455	31,887	39,921	56,688
U.S.A.	-	-	136,941	201,469	348,053	509,021

Source: Table 5-23 and various reports

Table 5-30: Distribution of Total Number of Hunting Days by Type of Hunting, by Region, 1970 and 1980

(In Thousands)

NPA REGIONS	Percent Small Game	Percent Big Game	Percent Waterfowl	Small Game		Big Game		Waterfowl	
				1970	1980	1970	1980	1970	1980
NEW ENGLAND	61%	27%	12%	5,202	3,368	2,303	1,491	1,023	663
MIDDLE ATLANTIC	61%	27%	12%	15,143	12,613	6,703	5,583	2,979	2,481
GREAT LAKES	61%	27%	12%	22,540	22,114	9,977	9,788	4,434	4,350
SOUTHEAST	61%	27%	12%	25,834	26,686	11,435	11,812	5,082	5,250
PLAINS	61%	27%	12%	20,446	18,973	9,050	8,398	4,022	3,732
SOUTHWEST	61%	27%	12%	14,952	18,794	6,618	8,319	2,941	3,697
MOUNTAINS	60%	35%	5%	3,939	4,900	2,298	2,858	328	408
FAR WEST	61%	27%	12%	16,460	21,456	7,285	9,497	3,238	4,221
U.S.A.	-	-	-	124,516	128,904	55,669	57,746	24,047	24,802

Source: Table 5-25 and BOR 1970 Survey

Table 5-31. Distribution of Total Number of Camping Days by Type of Camping, by Region, 1970 and 1980

(In Thousands)

NPA REGIONS	Percent Trailer	Percent Tent	Trailer		Tent	
			1970	1980	1970	1980
NEW ENGLAND	64%	36%	18,358	20,952	10,327	11,78
MIDDLE ATLANTIC	64%	36%	38,068	44,300	21,413	24,91
GREAT LAKES	64%	36%	54,596	63,782	30,710	35,87
SOUTHEAST	64%	36%	37,521	46,246	21,105	26,01
PLAINS	64%	36%	24,358	26,415	13,701	14,85
SOUTHWEST	64%	36%	21,127	26,148	11,884	14,70
MOUNTAINS	64%	36%	10,364	11,800	5,830	6,63
FAR WEST	64%	36%	64,126	73,256	36,071	41,20
U.S.A.	-	-	268,518	312,899	151,041	176,00

Source: Table 5-26 and various reports

These breakdowns, expressed as percentages, and the resulting activity days are shown in Table 5-24 for boating, Table 5-27 for hunting, and Table 5-29 for camping should be regarded as estimates.

In order to estimate the number of participants in each recreation activity per day during the season, the total annual number of activity days was divided by the number of days in the season of each recreation activity as obtained from a variety of unpublished sources. The results of the division are shown in Tables 5-32 through 5-37.

Selection of appropriate standards for land/water area requirements associated with outdoor recreation activities is difficult. The major reasons are the absence of uniform definitions and very large numerical differences in the land and/or water areas specified for outdoor recreation activities.

In order to select the land/water area standards used in this report a comprehensive examination was made of the space standards compiled and published by the BOR in a report[a] that summarizes over 130 reports and studies.

Land/water area standards used in this report were selected to represent the average representative size of the standard areas reported. It is pertinent to note, therefore, that the selected standards listed below represent professional judgment.

The following standards were used:

---

[a]Bureau of Outdoor Recreation, 1970, Outdoor Recreation Space Standards. G.P.O. Washington, D. C.

Table 5-32. Length of Season and Number of Boaters Per Day During the Season by Type of Boating by Region, 1970 and 1980

NPA REGIONS	Length of Season		(In Thousands)			
	Marina Based Boats: Days	Trailered Boats: Days	Marina Based		Trailered	
			1970	1980	1970	1980
NEW ENGLAND	120	90	109	143	309	406
MIDDLE ATLANTIC	120	120	236	347	501	737
GREAT LAKES	120	90	297	425	841	1,206
SOUTHEAST	120	120	255	416	542	883
PLAINS	120	90	28	36	426	552
SOUTHWEST	210	210	13	21	154	240
MOUNTAINS	210	210	4	5	42	60
FAR WEST	210	210	107	152	190	270
U.S.A.	-	-	1,049	1,545	3,005	4,354

Source: Various reports and Table 5-29

Table 5-33. Length of Season and Number of Swimmers Per Day During the Season by Region, 1970 and 1980

(In Thousands)

NPA REGIONS	Length of Season (Days)	1970	1980
NEW ENGLAND	90	1,528	1,811
MIDDLE ATLANTIC	90	4,899	6,291
GREAT LAKES	90	3,996	5,072
SOUTHEAST	90	4,167	5,875
PLAINS	90	1,425	1,780
SOUTHWEST	120	828	1,139
MOUNTAINS	90	462	609
FAR WEST	120	3,046	4,225
U.S.A.	-	20,351	26,802

Source: Various reports and Table 5-24

Table 5-34. Length of Season and Number of Hunters Per Day During the Season by Type of Hunting by Region, 1970 and 1980

	Length of Season			(In Thousands)					
	Small Game (Days)	Big Game (Days)	Waterfowl (Days)	Small Game		Big Game		Waterfowl	
				1970	1980	1970	1980	1970	1980
NEW ENGLAND	120	90	60	43	28	26	17	17	11
MIDDLE ATLANTIC	120	90	60	126	105	74	62	50	41
GREAT LAKES	120	90	60	188	184	111	109	74	73
SOUTHEAST	120	90	60	215	222	127	131	85	88
PLAINS	120	90	60	170	158	101	93	67	62
SOUTHWEST	120	90	60	125	157	74	92	49	62
MOUNTAINS	120	90	60	33	41	26	32	5	7
FAR WEST	120	90	60	137	179	81	106	54	70
U.S.A.				1,037	1,074	620	642	401	414

Source: Various reports and Table 5-30

Table 5-35. Length of Season and Number of Campers Per Day During the Season by Type of Camper by Region, 1970 and 1980

NPA REGIONS	Length of Season		(In Thousands)			
	Trailer (Days)	Tent (Days)	Trailer		Tent	
			1970	1980	1970	1980
NEW ENGLAND	200	90	92	105	115	131
MIDDLE ATLANTIC	200	90	190	222	238	277
GREAT LAKES	200	90	273	319	341	399
SOUTHEAST	200	90	188	231	235	289
PLAINS	200	90	122	132	152	165
SOUTHWEST	250	120	85	105	99	123
MOUNTAINS	250	120	41	47	49	55
FAR WEST	250	120	257	293	301	343
U.S.A.	-	-	1,248	1,454	1,530	1,782

Source: Various reports and Table 5-31

Table 5-36. Length of Season and Number of Picnickers Per Day During the Season by Region, 1970 and 1980

(In Thousands)

NPA REGIONS	Length of Season (Days)	1970	1980
NEW ENGLAND	120	370	374
MIDDLE ATLANTIC	120	1,000	1,101
GREAT LAKES	120	1,020	1,148
SOUTHEAST	120	861	1,038
PLAINS	120	425	445
SOUTHWEST	200	163	195
MOUNTAINS	120	136	154
FAR WEST	200	424	498
U.S.A.	-	4,399	4,953

Source: Various reports and Table 5-27

Table 5-37. Length of Season and Number of Fishermen Per Day During the Season by Region, 1970 and 1980

(In Thousands)

NPA REGIONS	Length of Season (Days)	1970	1980
NEW ENGLAND	90	328	416
MIDDLE ATLANTIC	90	916	1,130
GREAT LAKES	90	1,213	1,310
SOUTHEAST	210	669	807
PLAINS	90	666	672
SOUTHWEST	210	285	349
MOUNTAINS	120	125	165
FAR WEST	210	378	429
U.S.A.	-	4,580	5,278

Source: Various reports and Table 5-28

Boating[a]

Land area requirements: 2 acres per 100 boats

Land area requirements: water-based boats, 1.1 acre per boat

Water surface requirements: water-based boats, 1 acre per boat

Trailer boat: 1 acre per boat

Swimming[a]

Land area requirements: 130 sq. ft. per swimmer

Water area requirements: 70 sq. ft. of surface per swimmer

Hunting[b]

Land requirement for small game: 9 acres per hunter

Land requirement for big game: 64 acres per hunter

Land requirement for waterfowl: 4.5 acres per hunter

Camping[c]

Land requirement for trailer camping: 35 persons per acre

Land requirement for tent camping: 12 persons per acre

---

[a]Sources: Wisconsin Conservation Department. 1966. A comprehensive plan for Wisconsin outdoor recreation. Madison, Wisconsin, and U. S. Bureau of Outdoor Recreation. 1966. Water-oriented outdoor recreation: Lake Erie Basin. Ann Arbor, Michigan.

[b]Source: Wisconsin Department of Resource Development. 1962. Recreation in Wisconsin. Madison, Wisconsin.

[c]Source: Wisconsin Conservation Department. 1966. A comprehensive plan for Wisconsin outdoor recreation. Madison, Wisconsin, and California Outdoor Recreation Plan Committee. 1960. California public outdoor recreation plan: part II. Sacremento, California.

Note: In all cases, the Wisconsin Standards should not be regarded as design criteria.

Picnicking[a]

Land requirement: 35 persons per acre

Fishing[b]

Land requirements for fresh water: 800 square feet per fisherman

Surface water requirements for water: 3.6 acres per fisherman

The standards reflect the actual land required for construction of a facility, plus parking, plus a buffer zone allowance to separate the activity from other recreation activities and from contiguous uses. No standard or set of standards were found that adequately consider multiple recreation activities at a single complex. Private sector and state park resorts make effective use of the complementarity between overnight accommodations, marinas, campgrounds, swimming beaches, and golf courses in a single recreation area. Use of individual standards may overstate total acreage requirements, but addition of the additional acreage to buffer the larger recreation complex from incompatible contiguous uses seems appropriate.

Table 5-38 sets forth these standards expressed in uniform units in terms of acres per participant.

---

[a]Source: Wisconsin Conservation Department. 1966. A comprehensive plan for Wisconsin outdoor recreation. Madison, Wisconsin, and California Outdoor Recreation Plan Committee. 1960. California public outdoor recreation plan: part II. Sacremento, California.

[b]Sources: Wisconsin Conservation Department. 1966. A comprehensive plan for Wisconsin outdoor recreation. Madison, Wisconsin, and U. S. Bureau of Outdoor Recreation. 1966. Water-oriented outdoor recreation: Lake Erie Basin. Ann Arbor, Michigan.

Table 5-38. Land and Water Use Standards

Trailered Boats (@ 2.3 participants/boat)

Land = 0.0009 acres/participant

Water = 0.435 acres/participant

Marina-Based Boats (@ 3.7 participants/bpat)

Land = 0.300 acres/participant

Water = 0.270 acres/participant

Swimming

Land = 0.003 acres/participant

Water = 0.002 acres/participant

Hunting

Land

Small Game = 9 acres/participant

Big Game = 64 acres/participant

Waterfowl = 4.5 acres/participant

Camping

Land

Trailer = 0.029 acre/participant

Tent = 0.083 acres/participant

Picnicking

Land = 0.029 acres/participant

Fishing

Land = 0.018 acres/participant

Water = 3.6 acres/participant

Multiplication of these standards by the number of participants per day for each outdoor recreation activity resulted in land and surface water area requirements. These are shown in Tables 5-39 through 5-44.

As noted earlier, data were sought for natural area recreation use to support comparable calculations of requirements. It is reported that wilderness recreation and recreation in undeveloped natural areas has been growing at the rate of approximately 10% per year over the past several decades without evidence of slackening.[a]

B. National Expressions of Need

Congress has been responding to the nation's needs for recreational opportunity and fish and wildlife enhancement programs since the turn of the century. The national forest reserves, now under the management of the USFS, for example, were originally established by Congress in 1891. Twenty-five years later in 1916, Congress created the NPS to conserve the scenery, natural and historic objects, and wildlife in various areas of the country. Other early landmark statutes include the Recreation and Public Purposes Act of 1926, the Fish and Wildlife Coordination Acts of 1934 and 1946, and the 1944 Flood Control Act.

Beginning in the early 1960's, Congressional concern for recreation, fish and wildlife enhancement, natural beauty, and environmental quality intensified and the pace

---

[a]Fisher, A. C. and J. V. Krutilla. 1964. Valuing Long Run Ecological Consequences and Irreversibilities. Resources for the Future, Inc. (Reprint No. 117), Washington, D. C. and Fisher, A. C. and J. V. Krutilla. 1972. "Determination of Optimal Capacity of Resource-Based Recreation Facilities." Natural Resources Journal. Vol. 12 No. 6 (July).

Table 5-39. Land and Water Acreage Needed by Boaters During Season by Type of Boating by Region, 1970 and 1980 (In Acres)

NPA REGIONS	Marina-based Boats, Land			Trailer Boats, Land			Marina-based Boats, Water			Trailer Boats, Water		
	1970	1980	% Change	1970	1980	% Change	1970	1980	% Change	1970	1980	% Change
NEW ENGLAND	32,700	42,900	31	278.1	365.4	31	29,430	38,610	31	134,415	176,610	31
MIDDLE ATLANTIC	70,800	104,100	47	450.9	663.3	47	63,720	93,690	47	217,935	320,595	47
GREAT LAKES	89,100	127,500	43	756.9	1,085.4	43	80,190	114,750	43	365,835	524,610	43
SOUTHEAST	76,500	124,800	63	487.8	794.7	63	68,850	112,320	63	235,770	384,105	63
PLAINS	8,400	10,900	29	383.4	496.8	30	7,560	9,720	29	185,310	240,120	30
SOUTHWEST	3,900	6,300	62	138.6	216.0	56	3,510	5,670	62	66,990	104,400	56
MOUNTAINS	1,200	1,500	25	37.8	54.0	43	1,080	1,350	25	18,270	26,100	43
FAR WEST	32,100	45,600	42	171.0	243.0	42	28,890	41,040	42	82,650	117,450	42
U.S.A.	314,700	463,500	47	2,704.5	3,918.6	45	283,230	417,150	47	1,307,175	1,893,990	45

Source: Tables 5-32 and 5-38

Table 5-40. Land and Water Acreage Needed by Swimming During Season by Region, 1970 and 1980 (In Acres)

NPA REGIONS	Land Acreage			Water Acreage		
	1970	1980	% Change	1970	1980	% Change
NEW ENGLAND	4,584	5,436	19	3,056	3,622	19
MIDDLE ATLANTIC	14,697	18,873	28	9,798	12,582	28
GREAT LAKES	11,988	15,216	27	7,992	10,144	27
SOUTHEAST	12,501	17,625	41	8,334	11,750	41
PLAINS	4,275	5,340	25	2,850	3,560	25
SOUTHWEST	2,484	3,417	38	1,656	2,278	38
MOUNTAINS	1,386	1,827	32	924	1,218	32
FAR WEST	9,138	12,675	39	6,092	8,450	39
U.S.A.	61,053	80,409	32	40,702	53,604	32

Source: Tables 5-33 and 5-38

Table 5-41. Acreage needed for Hunting During Season by Type of Hunting by Region, 1970 and 1980 (Thousands of acres)

NPA REGIONS	Small Game			Big Game			Waterfowl		
	1970	1980	Change	1970	1980	Change	1970	1980	Chan
NEW ENGLAND	387	252	(35)	1,664	1,088	(35)	77	50	(35
MIDDLE ATLANTIC	1,134	945	(17)	4,736	3,968	(16)	225	185	(18
GREAT LAKES	1,692	1,656	(2)	7,104	6,976	(2)	333	329	(1)
SOUTHEAST	1,935	1,998	3	8,128	8,384	3	383	396	3
PLAINS	1,530	1,422	(7)	6,464	5,952	(8)	302	279	(8)
SOUTHWEST	1,125	1,413	26	4,736	5,888	24	221	279	26
MOUNTAINS	297	369	24	1,664	2,048	23	23	32	39
FAR WEST	1,233	1,611	31	5,184	6,720	30	243	315	30
U.S.A.	9,333	9,666	4	39,680	41,024	3	1,805	1,865	3

Source: Tables 5-34 and 5-38

Table 5-42. Acreage needed During Season by Campers by Type, by Region, 1970 and 1980 (in acres)

NPA REGIONS	Trailers			Tents		
	1970	1980	% Change	1970	1980	% Change
NEW ENGLAND	2,668	3,045	14	9,545	10,873	14
MIDDLE ATLANTIC	5,510	6,438	17	19,754	22,991	16
GREAT LAKES	7,917	9,251	17	28,306	33,117	17
SOUTHEAST	5,452	6,699	23	19,505	23,987	23
PLAINS	3,538	3,828	8	12,616	13,695	9
SOUTHWEST	2,465	3,045	24	8,217	10,209	24
MOUNTAINS	1,189	1,363	15	4,067	4,565	12
FAR WEST	7,453	8,497	14	24,983	28,469	14
U.S.A.	36,192	42,166	17	126,993	147,906	16

Source: Tables 5-35 and 5-38

Table 5-43. Acreage Needed During Season by Picnickers by Region, 1970 and 1980 (In Acres)

NPA REGIONS	1970	1980	% Change
NEW ENGLAND	10,730	10,846	1
MIDDLE ATLANTIC	29,000	31,929	10
GREAT LAKES	29,580	33,292	13
SOUTHEAST	24,969	30,102	21
PLAINS	12,325	12,905	5
SOUTHWEST	4,727	5,655	20
MOUNTAINS	3,944	4,466	13
FAR WEST	12,296	14,442	17
U.S.A.	127,571	143,637	13

Source: Tables 5-36 and 5-38

Table 5-44. Land and Water Acreage Needed by Fishermen During Season, by Region, 1970 and 1980 (In Acres)

NPA REGIONS	Land			Water		
	1970	1980	% Change	1970	1980	% Change
NEW ENGLAND	5,904	7,488	27	1,180,800	1,497,600	27
MIDDLE ATLANTIC	16,488	20,340	23	3,297,600	4,068,000	23
GREAT LAKES	21,834	23,580	8	4,366,800	4,716,000	8
SOUTHEAST	12,042	14,526	21	2,408,400	2,905,200	21
PLAINS	11,988	12,096	1	2,397,600	2,419,200	1
SOUTHWEST	5,130	6,282	23	1,026,000	1,256,400	22
MOUNTAINS	2,250	2,970	32	450,000	594,000	32
FAR WEST	6,804	7,722	13	1,360,800	1,544,400	13
U.S.A.	82,440	95,004	15	16,488,000	19,000,800	15

Source: Tables 5-37 and 5-38

of legislative action markedly quickened. Thus, in 1960 Congress passed the Multiple Use and Sustained Yield Act which declared that the National Forests were to be administered for outdoor recreation and fish and wildlife, as well as range, timber, and watershed purposes. In 1964, the Secretary of the Interior was directed to classify the various uses to which each parcel of Federal land could be put to avoid the loss of nationally beneficial uses, e.g., recreation and fish and wildlife, by the unwise transfer of certain parcels to different ownership (Classification and Multiple Use Act of 1964). That same year Congress established a framework for creation of a national network of Federal wilderness areas (Wilderness Act of 1964).

Two major statutes evidencing an increasing national interest in recreation and wildlife resources also became law in 1965. In the Federal Water Project Recreation Act, Congress recognized recreation and fish and wildlife activities as purposes which should receive full consideration in the planning and operation of every Federal WRDP. In the Land and Water Conservation Fund Act, Congress provided a means for improving the quantity and quality of outdoor recreation facilities.

The Transportation Act of 1968 provided that the planning of highways should give special recognition to preservation of the natural beauty of the countryside, public parks and recreational facilities, wildlife areas and historic sites. During the same year, a statutory basis was established for creation of a national system of outdoor trails (National Trails System Act of 1968) and a national system to preserve rivers possessing outstanding scenic, recreational,

fish and wildlife values (Wild and Scenic Rivers Act of 1968). Finally, in the National Environmental Policy Act of 1969, Congress declared a national policy of encouraging the productive and enjoyable harmony between man and his environment, and directed all Federal agencies to consider environmental values when proposing most major Federal activities.

In addition to legislation, Congress focused attention upon recreation, fish and wildlife, and other natural resources of national value through formation of two commissions, one to review Federal public land law (PLLRC) and the other to study outdoor recreation policies (ORRRC). ORRRC's report recommended the establishment of a national outdoor recreation policy, the creation of a systematized classification scheme for recreation lands, state-by-state long-range recreation master plans, a Federal grants-in-aid program, and the creation of a Bureau of Outdoor Recreation -- recommendations which have since been partially implemented. Congress has not yet acted upon PLLRC's findings, though a BLM Organic Act and a National Land Use Policy Act are presently being given active consideration.

With the exception of participation in the Land and Water Conservation Fund, the Corps has been assigned management responsibilities under each of the foregoing statutes, including recreation development, fish and wildlife enhancement, and natural resource protection.

C. Corps WRDP Resources and National Needs

The acreage required to satisfy national recreation, hunting, and fishing demands was shown to be increasing. Some regions of the nation will demonstrate dramatic changes, for example, a forecasted 42% increase in land needed to

support swimming activity in the southeast region.

Table 5-45 shows the supply of Corps WRDP lands and waters by regions appropriate to the projections of need. In the U. S., there are 4.3 million acres of surface water in Corps WRDPs available for swimming, fishing, marina-based boats, and trailered boats; 33,000 miles of shoreline to support fishing, boating, and swimming activities (RRMS 1973). There are 5,532,245 acres of land above normal pool elevation[a] held in fee by the Corps available to meet the needs for land-based recreation activities (RRMS 1973). Of the 5.5 million acres, 418,400 acres are classified by the Corps as suitable for intensive recreation development and are available to meet needs for marinas, launching ramps, campgrounds, picnic grounds, and swimming beaches; 2.4 million acres are classified by the Corps as primarily valuable for upland and/or big game and are available to meet hunting needs. The remaining 2.6 million acres, including 191,412 acres of identified natural area, are available for extensive recreation use requiring minimal investment in facilities. All of the 5.1 million acres of extensive recreation and wildlife lands and part of the intensive recreation area acreage are available for compatible multiple recreation uses; that is, more than 5.1 million acres are open for public hunting in season and the same acreage is available for extensive recreation users during the balance of the year.

The supply of land and water in the Corps WRDP system takes an added significance in three NPA regions not particularly well served by other national systems as shown in

---

[a] Case study analyses show that normal pool elevation may not always be the best dividing line between aquatic and terrestrial environments because of the zone partially above and partially below normal pool elevation that is periodically inundated.

Table 5-45. Corps Supply of Land and Water Available to Meet National Recreation and Fish and Wildlife Needs.[a]

NPA REGIONS	Water Surface (Acres)	Shoreline[b] (Miles)	Land for Intensive Recreation (Acres)	Land for Upland and Big Game (Acres)
NEW ENGLAND[c]	4,957	132	2,828	28,669
MIDDLE ATLANTIC[d]	5,561	91	8,307	10,362
GREAT LAKES[e]	307,929	2,886	23,223	157,890
SOUTHEAST[f]	1,481,951	15,532	152,146	1,071,729
PLAINS[g]	1,519,019	7,475	76,083	647,404
SOUTHWEST[h]	726,272	5,437	131,967	422,280
MOUNTAINS[i]	-	-	-	-
FAR WEST[j]	292,712	1,525	23,922	93,904
U.S.A.	4,338,401	33,078	418,476	2,432,238

[a] The totals represent combinations of Corps data reported by Engineer Division. The match with State lines is not exact.

[b] Fee in the U.S.

[c] New England Division.

[d] North Atlantic Division less Norfolk.

[e] North Central Division less St. Paul plus Pittsburgh and .3 of Louisville.

[f] South Atlantic Division, Lower Mississippi Valley Division, Ohio River Division less Pittsburgh and .3 of Louisville, plus Little Rock and Norfolk.

[g] Missouri River Division plus St. Paul.

[h] Southwestern Division less Little Rock.

[i] Excludes Montana (Plains) and Idaho (Far West).

[j] North Pacific Division and South Pacific Division.

the Nationwide Plan[a]. In the southeast, plains, and southwest regions, demand for WRDP-related activities is high and projections show significant percentage increases in the future. Data in Table 5-45 show that Corps WRDPs have more than 3.5 million acres of water surface, 28,444 miles of shoreline, and 2,141,413 of upland and/or big game land available to meet the demand.

There are legitimate national needs for various types of intensive recreation opportunities. Decisions to provide these opportunities at specific times and places are far more subject to market conditions. Some of the opportunities can be provided at some Corps WRDPs through innovative arrangements, such as the Lake Lanier Islands Authority (Georgia) under existing authorities; others, such as vacation -- or second -- homes, will be difficult to accommodate at Corps WRDPs.

Second homes would be a serious resource allocation problem if Corps WRDPs were the only supply of land to meet water-oriented second home demand. The data shown in Table 5-46 indicate a reasonable supply of land available at WRDPs created by private and quasi-public utility companies. Housing development focused on these WRDPs is exemplified at Lake-of-the-Ozarks (Missouri), Deep Creek Lake (Maryland), and Lake Gaston (North Carolina). Natural lakes, some TVA and BuRec WRDPs, and Great Lakes and sea coasts should be added to this stock. Also, Corps WRDPs where very little manageable land was acquired have already experienced intensive housing development.

---

[a]Bureau of Outdoor Recreation. 1972. Outdoor Recreation: A Legacy for America. G.P.O., Washington, D. C.

Table 5-46. Federal Power Commission Licensed Water Resource Development Projects by NPA Region[a]

Region	Number of Projects[b]	Water Surface (Acres)	Shoreline (Miles)	Number of Access Areas
New England	74	121,864	1,410	196
Middle Atlantic	39	36,614	394	152
Great Lakes	107	261,269	2,498	662
Plains	19	113,616	1,790	1,355
Southeast	75	493,021	9,418	1,830
Southwest	6	284,374	3,094	916
Mountains	38	214,680	1,063	309
Far West	166	223,027	1,853	393
TOTALS	524	1,748,465	21,520	5,813

[a]CZRC from U. S. Federal Power Commission. 1970. Recreation Opportunities at Hydroelectric Projects Licensed by the Federal Power Commission. Washington, D. C.

[b]Does not include irrigation district, state agency, pump storage, or non-reservoir licenses.

It was not possible to reaggregate existing data to quantify specific national needs for housing-based recreation opportunities that could be met by Corps WRDP resources[a]. In some cases, particularly at those WRDPs where housing development is already well advanced and is part of contiguous land use problems, Corps authority to work cooperatively with local governments -- and perhaps directly with developers -- could meet a portion of the needs while maintaining the integrity of the resources. In all such cases, analyses of the tracts in question should be conducted to determine whether the value of the natural recreation resource would exceed its value as high-density recreational resource[b].

D. Findings

1. The lands and water of the Corps WRDP system constitute a major segment of the supply of resources available to meet these needs both nationally and in the regions showing largest percentage increases.

2. The national need for outdoor recreation and fish and wildlife enhancement as expressed by the findings of Congressionally authorized Commissions and specific legislative acts can better be met by insuring that the full supply of Corps WRDP land is available to the public.

---

[a] The demand, in aggregate, is very large. See: Richard L. Regatz Associates, Inc. 1974. Recreational Properties: An Analysis of the Markets for Privately Owned Recreational Lots and Leisure Homes. Council on Environmental Quality, Washington, D. C.

[b] Fisher, A. C. and J. V. Krutilla. 1972. "Determination of Optimal Capacity of Resource-Based Recration Facilities". Natural Resources Journal, Vol. 12, No. 6 (July).

3. There are marked regional differences in the amount of land needed to meet intensive and extensive recreation use. The Corps WRDP system constitutes a significant supply of land and water in those regions where rapid rates of increase are expected and where there are few alternative Federal sources of supply.

4. The Corps WRDP system has high potential for meeting Congressional statements of national need for maintaining environmental quality, providing balanced recreation opportunities, and maintaining wildlife species populations at a high level for the use and enjoyment of all Americans.

CHAPTER 6

EVALUATION OF ALTERNATIVE MANAGEMENT SYSTEMS

A. Introduction

The Congress has granted to the Corps broad discretionary authority to plan, develop, and operate public recreation facilities, more specific authority to manage forest resources, and authority to cooperate in fish and wildlife management consistent with project purposes. These grants of authority constitute the present Corps responsibility for utilizing Corps managed land and water areas to provide for outdoor recreation and fish, forest, and wildlife enhancement in the public interest.

Recreation-resource management, however, is but one function of the total resource development and operation program of the Civil Works Directorate of the Corps. Recreation-resource management must, at the same time, be both consistent with the other authorized purposes and enhance public recreation benefits and protect and enhance the quality of the resources. It has been shown: "Operation of a series of water resource development projects on a single river system is a very complex decision-making process. The decision to save or release water at a given point for a given month affects not only the situation for that site and that month, but also for every other month and site as well."[a]

In this chapter, the following alternative management systems by which the Corps could discharge its recreation-

[a] King, D. H. 1972. Effects of Reservoir Operating Policy on Recreation Benefits. Virginia Polytechnic Institute & State University, Blacksburg, Virginia.

resource management responsibilities are evaluated:

(1) Lease or sale of WRDP lands to permit private use.

(2) Transfer of WRDP land to state governments or other Federal agencies.

(3) Retention of WRDP land under Corps management.

The evaluation of each alternative includes the assessment of the following major considerations:

(1) Effectiveness of the alternative system in meeting the recreation-resource management responsibilities associated with Corps WRDPs.

(2) Effect of the alternative system upon local tax structures.

(3) Effect of the alternative system on national needs.

(4) Effect of the alternative on the programs of the Corps and other agencies.

(5) Statutory, fiscal, and policy constraints that attach to the alternative.

B. Lease or Sale of Land to Permit Private Use

1. The Nature of Private Sector Involvement

In general, firms have successfully entered the recreation industry by developing and operating capital intensive, high density facilities in regions where there is high year around visitation or where a market can be developed. In these profitable areas, entrepreneurs can bid land away from other uses such as agriculture.

The unprofitable nature of some activities, such as

primitive camping, hunting, and nature study, have inhibited intensive private entry. Yet significant segments of Americans have expressed high levels of demand for opportunities to enjoy solitude while fishing, camping and boating. The provision of these non-market opportunities traditionally has been the role of the public sector.

2. Discussion

a. Effectiveness of Sale or Lease of Corps WRDP Land in Meeting Corps Responsibility

The private sector can effectively perform certain parts of the Corps recreation-resource management responsibility nationwide: provision of high density, capital intensive recreation facilities; development of residences and commercial establishments; and farming, grazing, or forestry. Market perceptions and flow of income would determine which portions of WRDPs would be purchased or leased if offered.

Because of existing long-term leases, the sale or long-term lease of all WRDP lands to the private sector could conceivably take 30 years to complete and would lead to land use at most WRDPs quite similar to that currently found at low MRL ratio WRDPs. The best recreation sites would be occupied by high density facility complexes made up of marinas, lodges, deluxe campgrounds for recreation vehicles, and even condominiums, golf courses and other amenities associated with planned community development; the intervening lands would have a strip of houses bordering the shoreline; and the balance would be subdivided (Old Hickory), farmed (John Day), grazed (Oahe), or subject to intensive industrial forest management (Clark Hill).

Present trends observed at the 29 sample WRDPs lead to the expectations that: the agricultural and forest land would be posted; cropping and silvicultural practices would only peripherally consider wildlife habitat; and grazing (except pasturage in the east) would compete with game.

Within this context, only part of the recreation responsibility would be met. Extensive recreation experiences, wildlife management, and public hunting would not be met. Access to the water for fishermen, swimmers, and boaters would become difficult. However, the responsibility to contribute to the Nation's forest supply could be met. Lakeshore management planning would be materially inhibited, and integrated shoreline and contiguous land use would depend almost entirely upon local zoning and building codes which are now non-existent or cover only small portions of the WRDP at an estimated 93.1% of all WRDPs.

A concern, however, is that profitable users will be in a position to bid the intervening land into higher yielding uses. This would further reduce the availability of lands for extensive recreation and for fish and wildlife enhancement.

b. Effect of Sale or Lease of Corps WRDP Land Upon Local Tax Roles

Any sale of land would augment local ad valorem tax income. In most states long term leases would not alter the present situation.

The economic costs and benefits resulting from sale of Corps recreation-resource land are not clear. Costs to local governments increase as more facilities are built,

particularly as housing is built, occupied seasonally, and then occupied permanently. The margin between tax income and service costs varies with balance and density (planned unit developments with multi-occupant structures and commercial activity vs. subdivisions).[a] Typical problems evidenced by frequent complaints from homeowners in the vicinity of both private and public WRDPs include inadequate police and fire protection, solid waste service (including collection and disposal), and roads and streets.[b]

Whether or not the taxes received by local government from development on property purchased or leased from the Corps exceeds the cost of the new services demanded cannot be determined without further study.

The development found at 11 of the surveyed WRDPs consisted of extensive (0.5 acre to 5 acres) suburban-type housing. According to a recent Council on Environmental Quality (CEQ) report[c], this type of growth is most injurious to the landscape, and costs local government more to service than is derived in tax income. Conversely, the CEQ report and other research has shown that large-scale, well-planned multi-density developments such as Reston, Virginia, yield tax streams to local government that are higher than the

---

[a] Real Estate Research Corporation. 1974. The Costs of Sprawl. G.P.O., Washington, D. C.

[b] Burby, R. J. and S. Weiss. 1970. Public Policy and Shoreline Landowner Behavior. University of North Carolina, Chapel Hill, North Carolina

[c] Real Estate Research Corporation. 1974.

cost of providing services.[a] Commercial establishments on private land pay taxes that exceed service costs.

Tax income from major commercial recreation facilities exceeds local government service costs. The degree to which the margin between revenue and service cost is related to land purchased or from lease income rebated to local government by the Corps without concomitant local government service costs, cannot be estimated without further study.

Current assessment practices undervalue agriculture and forestry land[b], but there are few local costs to service such land. Sale of lands to encourage private agriculture, forestry, and grazing would have a positive effect upon local tax bases.

The net effect of sale or lease of land to permit private use upon local tax bases will vary from jurisdiction to jurisdiction, dependent upon whether the initial capacity of local services is high and adequate development regulations are in existence, or whether a service infrastructure and development control mechanism must be created.

c. Effect of Lease or Sale of Corps WRDP Land on Existing National Needs

Meeting national needs for intensive recreation would be enhanced by the sale or lease of land to private interests. National needs for extensive recreation, however, would be adversely affected. The national need for retention

[a] Booz, Allen and Hamilton, Inc. 1973. The Economic Impact of Reston on Fairfax County Government. Gulf Reston, Inc., Reston, Virginia.

[b] Liner, C.W. 1972. "The Effects of Alternative Tax Policies on Land Use." In: Proceedings of the 1972 North Carolina Land Use Congress. Durham, North Carolina.

of aesthetically pleasing land with recreation and fish and wildlife value in public hands would be adversely affected, particularly in those parts of the country where Corps WRDPs constitute a major portion of the public lands available for hunting, fishing, and outdoor recreation.

d. Effect of Lease or Sale of Corps WRDP Land on Programs of the Corps and Other Agencies

Sale of land could have considerable adverse effect upon other Corps programs. Corps personnel would continue to develop lakeshore management plans to protect the nation's navigable waterways and the public interest in those bodies of water, as the St. Paul Engineer District is doing at Leech Lake, and the Little Rock Engineer District is doing at Lake Taneycomo. Both coordination between Corps interests and those of contiguous landowners, and augmented staffs would be required to protect the quality of the WRDP waters and supervise conservation of the shoreline as is now the case at Old Hickory.

Sale to encourage private use would have a deleterious impact upon state park agencies with heavy capital investment in resort state parks. Indiscriminate sale could put major competitors with new facilities in close proximity to older state-built lodges and marinas. As described in Old Hickory, a shift to larger, more modern marinas on private land diverted customers from the older facilities built on Corps land under lease. Thus exposed, some state park units could suffer losses.

The most serious effect would be upon state wildlife agency programs to provide public hunting opportunities. Lands leased or sold to private individuals would no longer be available to the general public.

If property is fronted with land that is subject to erosion or other threat, sale or lease to private individuals could result in some immediate public program to protect the shoreline. A specific instance was found at Clark Hill where, under a now abandoned policy, the Corps issued long-term lease agreements for private cottage construction to individuals. The lots upon which the cottages were built were subsequently sold to the lessees. Washing away of shoreland material is placing some houses in jeopardy, leading Corps project staff to propose protective structures to stabilize the land and protect the cottages.

e. Statutory, Fiscal, and Policy Constraints in Performance

A significant existing statutory constraint is the prescribed process for conveying title to Federal land into the private sector (no similar obstacles currently exist to leasing). First, the Corps must determine that the land is in excess of the needs of the Civil Works Directorate; secondly, all other Federal agencies must be offered opportunity to acquire the land; thirdly, state park and recreation agencies may choose to request transfer of the land to their jurisdiction under the Legacy of Parks Program (PL 91-485, §2, 40 USC 484(k)(2)). If all Federal and qualified park and recreation agencies find no use consistent with their mission for the land, it becomes surplus and available for competitive disposal by GSA.

How much land might be affected by the statute is closely related to statutory and policy constraints. Data from the 29 case studies show that of 2,763,451 total project

acres, only 1,091,046 acres are MRL. Of this total, 45,832 acres are under 25 to 50 year leases to state and local park and recreation agencies, and 464,000 acres are leased or licensed to USF&WS or state fish and wildlife agencies. An additional 7,573 acres are leased to quasi-public bodies, such as Boy Scouts, Girl Scouts, and 4-H Clubs. Thus, all but 573,600 acres are committed to purposes recognized as high priority public purposes and are ineligible for transfer as excess property.

Not all of the 573,600 acres, however, could be classed as excess by the Corps. Some WRDPs have large amounts of land below maximum flood pool, as at Hopkinton-Everett and Wappapello, and others have some more narrow land between normal pool and maximum pool elevations. If this amount is assumed to be 10% of MRL, or 109,105 acres, 464,495 acres could be available as surplus.

3. Finding

a. Sale to achieve greater private use of WRDP land would be an ineffective policy for meeting national needs; would reduce the area of land available for public hunting and other outdoor recreation, and would have a negative impact upon residual Corps programs and those of existing private cooperators. Sale would have a good chance to improve local tax bases, but the net improvement is not clear. In at least the short-run, sale would not promote Corps recreation-resource management opportunities.

b. The private sector can: provide high density, capital intensive recreation facilities, develop residences and commercial establishments, and conduct farming or forestry operations. Market perceptions and flow of income would determine which portions of WRDPs would be purchased or leased if offered.

High density facility complexes made up of marinas, lodges, deluxe campgrounds for recreation vehicles, condominiums, golf courses, and other amenities would occupy the best recreation sites and would accommodate part of the national need for such amenities. Opportunities for extensive recreation experiences, wildlife management, and public hunting would be reduced. Access to the water for fisherman, swimmers, and boaters would become difficult and, if carried to extremes, the general public could find itself excluded because of substantial admittance or user fees. Integrated shoreline and contiguous land use would depend almost entirely upon local zoning and building codes which are now nonexistent or inadequate.

Sale or lease of agricultural and forest lands could contribute to meeting national needs in those areas, but would also fail to meet the need for aesthetically pleasing public land with opportunities for recreation, fishing, or hunting.

Leasing selected lands to private interests to achieve specified goals and objectives, such as the provision of a full range of outdoor recreation opportunities, can be accomplished by modifying existing Corps concession authorities.

c. Any sale of land would augment ad valorem tax income. The net effect upon local tax bases will vary from jurisdiction to jurisdiction, dependent upon requirements for local services.

d. Meeting national needs for intensive recreation would be enhanced by the sale or lease of land to private interests. National needs for extensive recreation would be adversely affected. The national need for retention of aesthetically pleasing land with recreation and fish and wildlife value in public hands would be adversely affected, particularly in those parts of the country where Corps WRDPs can constitute a major portion of the public lands available for hunting, fishing, and other recreation.

e. Sale of land would have considerable adverse affect upon other Corps programs. Coordination between Corps interests and those of contiguous landowners would require augmented Corps staffs to protect the quality of WRDP borders and supervise conservation of the shoreline. Sale to encourage private use also would have a deleterious impact upon state park agencies with heavy capital investment in resort state parks, putting major competitors with new facilities in close proximity to older state-built lodges and marinas. The most serious effect would be upon state wildlife agency programs to provide public hunting opportunities. Lands leased or sold to private individuals would be largely unavailable for general public entry. Sale of property on eroding shorelines would result in requests for public assistance for shoreline protection.

f. There are significant statutory and policy constraints that would actively inhibit the sale of Corps land to private individuals. The most significant are the processes described for state and other Federal agency review of real property declared excess. If all present properties outgranted to other public agencies were claimed

by those agencies and no additional property declared excess is claimed by them, only 464,495 acres of the 2,763,451 acres in the 29 WRDPs studied would become surplus. In addition, much of the WRDP land is encumbered by existing outgrants.

C. Transfer of Corps WRDP Land to Other Federal, State or Local Agencies

1. Federal Agencies

a. The Nature of Other Federal Involvement

Excluding the Corps, the U. S. Department of the Interior (USDI) and the U. S. Department of Agriculture (USDA) possess the majority of Federal resource management experience. Within each department, one or more agencies have experience in planning and implementing recreation, fish and wildlife, and forestry programs.

In USDI, the BuRec most closely parallels the Corps' Civil Works activity. All Civil Works programs except navigation have counterparts in the BuRec. BuRec, however, is concerned with irrigation, distributes project costs to local sponsoring agencies based upon water values differently from the Corps, and traditionally contracts recreation management to other agencies[a]. Only six BuRec WRDPs do not have all MRL outgranted to other agencies.

---

[a]When peripheral development and heavy recreation visitation occur, local contracting agencies encounter serious problems. Special legislation enacted by the 93rd Congress provided for transfer of the Federal land at the BuRec's Berryessa WRDP in California from a local cooperator to the NPS.

The NPS, another USDI agency, has been the primary consultant to BuRec in the planning and design of WRDP recreation facilities and programs. The NPS has an active administrative role at WRDPs such as Lake Meade, Lake Powell, Blue Mesa, and Grand Coulee[a] that have been included in the National Park System as National Recreation Areas (NRA).

A third USDI agency with both an involvement and interest is the USF&WS. Some 378,028 acres of the National Wildlife Refuge System are located at Corps WRDPs.

Operations of the fourth USDI agency, the BLM, are limited to the outer Continental Shelf and west of the 100th meridian. Further, the agency is severely limited by lack of a comprehensive resource management statute.

Of the four USDI agencies, only the NPS and the USF&WS report to the same assistant secretary. Program coordination among them emanates from the secretarial level.

In USDA, the USFS is a well integrated line organization with 70 years of forest, watershed, fish and wildlife, range, and recreation management experience. USFS experience is enhanced by WRDP management responsibility shared with the Corps according to a Memorandum of Understanding first entered into by the Secretaries of Agriculture and Army in 1964. The

---

[a]These NRAs are in the west and that WRDP take-lines extended primarily into public domain which could be withdrawn for reclamation purposes. Thus, the MRL ratios are high, the scenery is expansive, and, since the WRDP has been withdrawn from public domain, the majority of the contiguous land within a reasonable analytical unit is in public ownership.

Memorandum guides the roles of the agencies when a WRDP is: constructed entirely within a national forest involving land already owned by the U. S., constructed within a national forest but involving land acquired by the Corps with project funds, or constructed so WRDP lands acquired by the Corps are contiguous with a national forest boundary.

b. Discussion

1) Effectiveness of transferring Corps WRDP land to other Federal agencies.

The only Federal agencies with experience in the dual recreation-resource management responsibility assigned to the Corps are the BuRec and NPS. BuRec WRDPs are administered in a mode similar to Corps WRDPs except that the BuRec enters into contracts with local special purpose districts to operate WRDPs. By doing so, however, WRDP special purposes are sharply defined by binding repayment schedules. For example, a recent report illustrates the role of the Casitas Municipal Water District as WRDP operator, employer of uniformed park personnel to operate NPS designed facilities, and planner of contiguous land use[a].

Transfer of all Corps recreation-resource management to the NPS would enlarge the NRA system by 407 units. Such a dramatic increase in acreage and recreational visitation would require expansion of NPS regional organization and shift the main focus of the organization from its generally accepted role as protector of natural and cultural treasures of national significance to a provider of recreation services. The dichotomy between recreation use and resource protection has become a particularly difficult issue within the NPS in interpreting its basic charge.[b]

---

[a] Montgomery Research, Inc. 1972. Watershed Development Impact on Lake Casitas. Ventura County Planning Department, Ventura, California.

[b] National Park and Conservation Association. 1969. Wilderness and the National Parks. Washington, D. C.

Transfer of recreation-resource management to the USF&WS or the BLM would impose very large recreation burdens upon agencies that have little experience with large-scale visitation.

The USFS has demonstrated that it can plan, develop, and operate public recreation facilities, manage forest resources, and cooperate in fish and wildlife management. USFS is experienced in administering outgrants and its operations are well systematized. Thus, the USFS could meet the Corps' obligations for management.

Dividing project responsibilities between two or more Federal agencies would lead to problems of coordination and probable duplication of effort. Additionally, personnel requirements imposed on any of the candidate recipient agencies would sorely tax agency budgets and could jeopardize existing programs.

2) Effect of transferring Corps WRDP land to other Federal agencies upon local tax structures.

The only effect would be the formula used to determine payments in lieu of taxes to local governments. The NPS has no in lieu provisions. The USFS provides for payment to local governments of up to 35%[a] of gross receipts from all national forest sales and rentals, considerably less than presently distributed by the Corps.

---

[a]The USFS provides for payment of 25% of gross receipts from all national forest sales and rentals to local governments where the income was earned. An additional 10% of gross receipts is expended for roads and trails within the national forests. Thus, jurisdictions containing high income producing national forest resources receive larger annual payments than jurisdictions where national forest use yields low revenues and high income national forests reinvest larger amounts for development of roads and trails than low income national forests.

3) Effect of transferring Corps WRDP land to other Federal agencies on meeting existing national needs.

Transfer to the NPS would provide recreation administration to meet national needs more effectively than Corps administration. In meeting national needs for hunting and fishing, it is assumed that the primacy of state ownership of fish and wildlife resources would be recognized by the NPS, but it is not certain whether existing outgrants to state fish and wildlife agencies would be continued. Outgrants to the USF&WS would be feasible; conceivably as a jointly administered NRA. Thus, national hunting and fishing needs may not be met.

Transfer to USFS, on the basis of that agency's history, could mean that a decrease in emphasis upon intensive recreation development could occur unless the expertise of the agency in cooperative Federal-private development of winter sports areas could be brought to bear. Extensive recreation needs would be uneffected, and hunting and fishing needs would be better met.

4) Effect of transferring Corps WRDP land to other Federal agencies on the programs of the Corps and other agencies.

The impact upon the Corps would be substantial. The cadre of resource professionals who devote time jointly to assessing environmental impacts and to recreation-resource planning would be reduced; similarly, professional personnel performing dual functions at the project level would be reduced; and all personnel devoting full time to recreation-resource activities, including rangers, would be released or transferred to the recipient agency. Thus, a growing conservation force operating within the Corps would be lost. However, all personnel now responsible for the operation of waterways, powerhouses, and dams would remain at the WRDPs, but their

utility to perform recreation-resource management work would be negated.

The impact upon the recipient agencies would be profound. The NPS would have to become much more of a multiple use agency. The USFS would have the geographic distribution of its work load shifted from the western regions to the south central and southeastern census divisions -- areas where administration of the national forest system is diffused within one very large region.

The NPS currently has no involvement with Corps WRDPs; the USFS administers land for multiple purposes in conjunction with the Corps as outlined above. Both NPS and USFS would require substantial staff and administrative reorganization to cope with the problems of resource management, visitor protection, cooperative relations with state and local agencies, and the boundary, access, and fish and wildlife problems unique to WRDPs.

5) Statutory, fiscal and policy constraints on transfer of Corps WRDP land to other Federal agencies.

Only the USFS could, with minor legal adjustment, accept the management responsibility for land and water at Corps WRDPs. For the NPS, the Congress would have to make individual determinations of the national recreation significance of each WRDP to be entered in the system. USF&WS would need a completely redefined agency mission and the BLM would need an even more extensive legislative reorganization than was considered by the 93rd Congress, although many aspects of the proposed legislation are apropos to Corps WRDP problems.

Transfer of the recreation-resource management function implies retention of the majority of the present Corps district and project level staffs since these reflect the basic requirements of the Corps' engineering responsibility. Assigning the recreation-resource management function to another Federal agency would cause duplication of field organizations and inefficient use of manpower.

Opinions expressed by field officers of USDI and USDA agencies and state personnel indicate that the Corps has an enviable record for receiving the appropriations requested and that the potential recipient agencies would not be successful in securing funds to develop and manage the resources to adequately provide quality outdoor recreation experiences at the levels expected. USFS officers have not been aggressive in extending USFS management to WRDP lands for this reason. USFS recreation operations and maintenance appropriations approximate 50% of the amounts needed according to the Recreation Information Management System.

Closely linked to the availability of adequate funding levels is the necessity for the new recipient agency to adapt to the complex funding provisions such as special repayment schedules and cost sharing associated with each WRDP or system of WRDPs.

c. Findings

1) No single Federal agency matches the Corps in breadth of management responsibility, staff, funding, and, most important, experience with continuous management of large complex structures, water resources and land resources as interrelated regional systems.

2) It would be possible to transfer the management of recreation, fish, wildlife, and forest management to

another Federal agency. The agency best suited by existing statutory authorities and experience to meet multi-purpose national needs would be the USFS. The NPS, USF&WS, and BLM could conceivably be recipient agencies. Transfer to any of these agencies would require:

(a) A very large proportional shift in existing philosophies and program emphasis.

(b) Major, large-scale administrative reorganization.

(c) Revamping of in-lieu of tax payment authority.

3) Transfer of resource management functions would result in:

(a) Duplication of field operations staffs.

(b) Less ability to share recreation tasks with other project operation functions now performed by Corps WRDP staffs.

2. State and Local Agencies

a. The Nature of State Involvement

Three major elements are essential for recreation-resource management: (1) policy, land use, and functional planning; (2) field monitoring and key environmental resource control; and (3) development and management of state owned land and water resources. None of the six state agencies investigated contained all of these elements.

Policy planning is usually associated with a state planning office. Usually, a multi-disciplinary group acts

as staff to the governor and cabinet-level officials in establishing state recreation-resource management objectives, roles, and relationships. In some states, this work is done by a division within the executive office of the governor (Texas) and in some by a major staff department (Economic Planning and Development in Arizona, Department of State Planning in Maryland). These staff departments also administer community planning programs and attempt to achieve coordination through the units of general government.

In some states field monitoring and control of key environmental resources have been combined with other (Pennsylvania Department of Environmental Protection) or all (Maryland Department of Natural Resources) aspects of resource development and management. In some states, all development and management is consolidated in a single department (Ohio and Minnesota Departments of Natural Resources); in other states (Texas Department of Parks and Wildlife and Missouri Department of Conservation), resource development and management are only partially consolidated; while in some states there is little or no consolidation (Washington Departments of Fisheries, Natural Resources, Ecology, Game, and Parks and Recreation). The greater the consolidation, the more comprehensive functional planning and agency programming become.

Principal state involvement in recreation-resource management at Corps WRDPs is through agencies charged with responsibility for fish and wildlife, parks and/or recreation, and forestry. Even within these agencies, variations are

significant. For example, a law enforcement group may have a field organization separate from the management organization, while in other states, enforcement may be a secondary responsibility of managers.

b. Discussion

1) Effectiveness of transferring Corps WRDP land

Analysis of 29 Corps WRDPs revealed that the Corps has actively sought to lease or license as much land to state agencies as possible. The amount outgranted is representative of state interest and capability. A portion of all WRDPs surveyed, except Isabella, Colebrook, Black Warrior, Leech, Robert S. Kerr[a], and Dworshak[b] is currently outgranted to state agencies.

At Hopkinton-Everett, the state planning agency prepared a land use master plan allocating the WRDP land to recreation, recreation reserve, agriculture, forestry and waterfowl. Agricultural leasing is performed directly by the Corps while the remaining acreage is leased to the New Hampshire Department of Resources and Economic Development (NHDRED). The Parks Division of NHDRED is responsible for the state park (200 acres). The balance of land is subject to multiple use management administered by the Parks and Forestry Divisions of NHDRED and the New Hampshire Department

[a]The majority of MRL at Robert S. Kerr is outgranted to USF&WS.

[b]The Corps has been negotiating with the State of Idaho for state operation of a recreation area.

of Fish and Game (NHDFG). State park development costs are paid by the Corps. Staffing from all agencies is minimal and management is not intensive. Three small recreation areas originally designed for use and operation by municipal government were deleted from the state lease when the municipality failed to assume responsibility.

Outgrants at Foster J. Sayers have been made to the Pennsylvania Bureau of State Parks (PBSP), the Pennsylvania Game Commission (PGC), and the Pennsylvania Historic and Museum Commission (PHMC). Additionally, two small municipal recreation areas are outgranted to local governments by the Corps. Recognition of area wide water quality problems by the PBSP and the Corps has resulted in innovative planning and programming, including a waste water collection and treatment system built by the Corps and operated by PBSP. Neighboring municipaliites may connect to the system. PHMC development is very limited in scope, and PGC has no specific plans for its area.

Lands at Mosquito Creek are outgranted to the Ohio Department of Natural Resources (ODNR). All divisions and bureaus of the department cooperate in managing the resources. Typical WRDP conditions prevail: Deeper, high value recreation water near the dam; and shallow, marshy areas at the head of the lake. The Ohio Division of Parks (ODP) manages the recreation resources at the dam, where the recreation area (designed, built, and operated by ODP) is among the ten most heavily visited in the Corps WRDP system. The Ohio Division of Fish and Game (ODFG) manages the shallow water and adjacent land. The dividing

line between the two divisions is marked by a buoy line in the lake. Significantly, ODFG has acquired additional contiguous land for game (primarily waterfowl) management. There is little or no difference in the intensity of management applied to fee land as contrasted with leased land.

At Alamo, all project land is leased to the Arizona Department of Game and Fish (ADGF); 4,800 acres of these project lands are also leased to the Arizona State Parks Department (ASPD). Recreation planning and development is done by the Corps and no conflicts between the departments are evident.

These four WRDPs are relatively small, and are almost exclusively flood control structures that require a much different Corps involvement in structure operation and maintenance than structures that include hydroelectric power and/or navigation locks.

At the remaining 19 WRDPs, state park agencies have leased specific, usually choice, parcels for development and operation as self-contained parks (that is the day use, overnight, and interpretive facilities, including trails, are limited to the leased area); state fish and wildlife agencies may either have licenses or leases covering all MRL or specific parcels.

All WRDP lands, except those needed for project operations and those outgranted as parts of the National wildlife refuge system are subject to state seasons, bag limits, and enforcement of state fish and game laws and regulations. This provision of law is not always formalized except when all project lands are outgranted to a state fish

and wildlife agency subject to multiple use of specific parcels by the Corps or other agencies. Outgranting parcels to a state fish and wildlife agency implies that only those parcels have value for fish and wildlife, which is not true.

Of the four WRDPs where the total MRL was outgranted to the states, only at Mosquito Creek is the outgrant to a single state department which includes all the actively engaged line functions. In all other cases, comprehensive management requires interagency coordination.

The amount of Federal land now outgranted probably represents all that the states would actively seek for recreation-resource management. States have demonstrated little interest in WRDPs that are large or that are interstate in nature. Particularly with respect to fish and wildlife resources, the states actively manage only portions of the land outgranted to them.

2) Effect of transferring Corps WRDP land to the states upon local tax structures

Presently, the Corps distributes 75% of all income derived from leases to local government. Any transfer to the states of land now outgranted to private individuals would reduce the income available for distribution to local government. This was illustrated in Oklahoma where the Department of Wildlife Conservation was anxious to assume management of land outgranted to them for fish and wildlife. The same land was also leased by the Corps to individuals for livestock grazing. Elimination of the grazing leases would reduce not only competition between livestock and game animals but also the funds received by local governments.

Some states attempt to offset loss of ad valorem property tax income that results from state acquisition of land. In New Hampshire, the NHDRED must pay to the town(s) the existing level of taxes where property has been acquired for park purposes until development is complete and the park is declared open for public use. Thereafter, the in lieu of tax payment is reduced 20% per year until no further in lieu payments are made. Also in New Hampshire, towns may apply to NHDRED for payments in lieu of taxes on state and Federal forest land. The payments are calculated by applying the current town tax rate to a value of the land comparable to its current assessed value.

In North Dakota, the Department of Fish and Game must pay from its revenue sums in lieu of taxes that equal the taxes yielded by the property at the time of acquisition. Other examples are cited in Chapter 4.

3) Effect of transferring Corps WRDP land to the states on existing national needs

The transfer of WRDP recreation-resource lands to the states would continue stewardship in public hands. Based upon conditions found at 29 WRDPs, the national needs for hunting and fishing would be met at least as well as they are now. Given future increases in fishing demand, however, investments in fish enhancement would be needed. Investments in wildlife habitat enhancement would also be necessary although this cannot be demonstrated by ordinary demand calculations.

Recreation development choices would be made based upon state needs rather than a perception of national or even multi-state regional needs. The differences in how these perceptions would work are intimated by the organizational location of the parks function, e.g., tourism and parks, parks and recreation, parks with economic development, and parks with environmental protection.

Transfer of all WRDP recreation-resource management to the states would only partially meet national needs.

4) Effect of transferring Corps WRDP land to the states on the programs of the Corps and other agencies

Transfer of Corps WRDP land to the states would require the coordination of other Corps responsibilities with one or more states and, if the present situation is indicative, more than one agency in each state. The integrated management of the full complement of water and land resources within each WRDP and system of WRDPs would become much more difficult.

The impact of nationwide transfer on state park, fish and wildlife, and forestry agency programs would be enormous. For some states it would be a 300% or more increase in state lands to be afforded protection and management. To replace existing Corps recreation-resource management personnel at WRDP lands would require at least 2,800 permanent employees and 2,300 temporary employees, which we found to be inadequate, in the state forestry, park, and fish and wildlife agencies in 42 states.

Equally important, acceptance of recreation-resource management responsibilities would skew total state programs in states where WRDPs are concentrated toward the recreation potentials of WRDPs and away from other areas with equally important fish and wildlife potentials. The director of Oklahoma's state park agency was especially forceful about this point in explaining his state's lack of interest in participating in the cost-sharing provisions of the Federal Water Project Recreation Act (PL 89-72). Given the choice of providing recreation and hunting and fishing opportunities statewide or concentrating on Corps WRDPs, most states would choose the former.

While administration of recreation and other resources at Corps WRDPs fits very well in the plans of some states, as demonstrated in Ohio, Indiana, Kentucky, and Tennessee, it is not the case nationwide.

There will be some impact on local cooperators if responsibility is shifted to the states. Local governments have been able to avail themselves of recreation areas and facilities acquired and built by the Corps; presently they are able to share the cost of improvement and expansion of these areas with the Corps under the Code 710 program. Under state administration, cost sharing would be limited to the Land and Water Conservation Fund. As a result local governments would be less able to maintain existing facilities at the WRDPs.

Transfer of Corps WRDP land to the states must ultimately require state planning and environmental agencies to become more actively concerned with the multiple problems

found on the contiguous lands, most of which degrade the aesthetics and other aspects of environmental quality at the WRDPs.

5) Statutory, fiscal, and policy constraints on transfer to the states.

National Data Series[a] indicate a decline of combined general and dedicated fund appropriations to state natural resource agencies relative to total state budgets. Data from the state resource agencies surveyed show that the largest portion of the funds available to them came from dedication of hunting and fishing license sales and Federal categorical grants-in-aid. The dedicated revenue sources have not expanded as rapidly as inflation. All state fish and game agencies visited during this study reported cut-backs in programs largely due to erosion of the purchasing power of the funds available. New funding from general revenue would be required and in the face of mounting competition from other state agencies and current state budget short falls, the probability of this happening is not good. Missouri took a proposal to dedicate revenue from a tax on soft drinks to statewide referendum where it failed passage.

The director of planning, Tennessee Department of Conservation, reflected the view of a large number of park and recreation officials and state legislative budget analysts when he emphasized that shortages of funds at the state level are most acute in continuing operations and maintenance. The

[a] U. S. Bureau of the Census. 1974. Census of Governments. Washington, D. C.

concensus is that states must increasingly quantify the continuing costs of new program starts, even if their capital needs are funded by grants-in-aid or gifts of lands, and reject those new projects which will cause the state budget to exceed revenues. The point is particularly significant for fish and wildlife which is labor intensive rather than capital intensive and for state park and recreation programs which seldom meet operation and maintenance costs from revenue.

c. Findings

Transfer to state agencies of the full responsibility for present Corps recreation and resource management lands does not appear feasible because of severe fiscal constraints. These fiscal restraints are even more evident for local governments. State administration of the resources would in some instances be a more effective way of discharging Crops responsibility for recreation and fish and wildlife, and it is toward this end that current Corps policies encourage state participation to the maximum extent possible. This participation should be continued and further encouraged even to the extent that some small or anachronistic WRDPs could be transferred to applicant states upon a finding by the Chief of Engineers that sufficient operating competence exists to protect the public interest, with reversion provisions.[a]

Additionally, a voluntary national program to transfer present Corps management responsibilities to state and local government will not materially change the present size or nature of the Corps management role; if successful or mandated, the impact upon the Corps would approximate that of

[a] An example in the WRDPs surveyed in Leech Lake

transfer to another Federal agency. Plus the Corps would have to integrate water resource management with many state agencies and land management programs.

D. Retention of Corps WRDP Land by the Corps of Engineers

1. Discussion

Analyzing this alternative according to the five considerations used to evaluate other alternative management systems reveals that:

a. Corps retention is the most effective way of maintaining consistency with other WRDP purposes while enhancing public recreation benefits, and protecting and improving the quality of fish and wildlife resources on WRDP lands. The Corps has developed a management system that combines the best elements of the alternatives discussed: encouraging the private sector to provide services for which there is a clear and profitable market, outgranting appropriate resources to state and local entities, and cooperating, through outgrants and otherwise, with state and other Federal agencies. The principal shortcomings of this alternative are the current absence of clear direction and administrative responsibility and the lack of sufficient adequately trained professionals.

b. The effect on local tax structures is difficult to assess precisely. Currently local communities receive a fixed return based on distribution of a percentage of lease income. Their return from private development would be a function of sales and would fluctuate.

c. Within the frame work of the liberal Corps policy of outgranting lands to states and encouraging private sector participation, this alternative offers the greatest potential for meeting the full range of national recreation resource needs.

e. The statutory constraints are minimal, although a clear statement of Congressional will is lacking. Within the Corps, master planning procedures must be strengthened if the potential benefits from the Corps WRDP system are to be realized.

The Corps has recognized opportunities for innovative management in the new aquatic environments created by water resource development projects. This recognition is evidenced by: support of research in reservoir management at the USF&WS station at Fayetteville, Arkansas, symposia on reservoir fishery resources (University of Georgia 1967), and construction and operation of project-related fish hatcheries; cooperation in reservoir and tailwater fisheries management by state fisheries agencies; and the specific steps taken to correct tailwater deficiencies at WRDPs such as John Day and Table Rock.

The Corps has evolved a management system that combines the best elements of the alternatives discussed which: encourages the private sector to provide those services for which there is a clear and profitable market; outgrants to state and local entities of resources that contribute to the goals and objectives of the respective agency; and is cooperative, through outgrants and otherwise, with state and other Federal agencies.

Hence, the best utilization of Corps WRDP land is achieved by this alternative, subject to the provisos that particular deficiencies are overcome and opportunities are created to transfer title to certain lands to Federal and state agencies.

CHAPTER 7
RECOMMENDATIONS

Corps WRDP land should be retained by the Corps and managed for public recreation, fish and wildlife enhancement, and other project purposes, if certain deficiencies are overcome. The most significant of these deficiencies and proposed remedial measures are discussed below.

A. National Policy and Statutes

The majority of problems associated with Corps use of WRDP land for recreation and fish and wildlife enhancement can be attributed to the lack of firm national policy direction. It is necessary for Congress to clarify the national position with respect to the use of Corps lands for such purposes. For example, while Corps WRDP land outgranted to the USF&WS are inviolate parts of the national wildlife refuge system, adjacent land used for extensive recreation and non-migratory wildlife is subject to continual evaluation for relevance to authorized project purposes.

1. There should be a congressional declaration of policies toward recreation and fish and wildlife resources at WRDPs under the control of the U. S. Army Corps of Engineers. The policies should consist of:

a. A finding that the WRDP system administered by the Corps has substantial potential for recreational use by the people of the United States, and that the provision of facilities for outdoor recreation at such projects will contribute substantially to the health, vitality, and well-being of the public.

b. A directive that the WRDP system administered by the Corps can and should be managed in such a manner as will contribute to the preservation, protection, and enhancement of the Nation's fish and wildlife resources in perpetuity.

c. A declaration that it is important to the effective utilization of the WRDP system administered by the Corps that the Corps have adequate authority to protect and maintain the quality of water at such projects.

The declaration of policies for the WRDP system restates and clarifies previously enunciated Congressional declarations of purpose which have recognized the intrinsically important role Corps WRDPs can and should play in our nation's recreational and conservation programs. These declarations also charge the Corps with the perpetual responsibility for protecting and managing these resources.

2. Although the Secretary has possessed authority since 1944 under 16 USC §460d and since 1946 under 16 USC §663c to manage land for the enhancement of fish and wildlife, there still exists a lack of Corps authority in this field with regard to older WRDPs. Thus, the Secretary of the Army should have specific authority to set aside and manage lands at present and future water resource development projects for the enhancement of fish and wildlife and enter into leases or other agreements with state or local public agencies to further the enhancement of wildlife resources through proper management.

At a significant number of the lakes surveyed, areas outgranted to state or local wildlife agencies were not

adequately monitored by Corps personnel. This, as well as other problems, are due in large part to the lack of a specific legislative directive to the Corps to develop, operate and maintain areas for the enhancement and protection of fish and wildlife, particularly at older projects.

3. The Secretary of the Army should be authorized to construct, maintain, and operate facilities for recreation or fish and wildlife enhancement which are beyond the minimum level established by section 3 of the Federal Water Project Recreation Act (16 USC §4601-14) in two well-defined situations:

a. The proposed facilities must serve a national, as opposed to a merely local interest, and there must be no likelihood that any non-Federal public body will agree to administer the facility and contribute to its costs pursuant to section 2 of the Federal Water Project Recreation Act.

b. Facilities which have been provided at public -- usually Federal -- expense would be operated and maintained at whatever level of development they had achieved whenever their administration is turned back to the Corps. Additional development would be permitted only when a national interest also existed.

These provisions are not intended to defeat the concept of local cooperation for local benefits which is embodied in the Federal Water Projects Recreation Act, as amended. The first merely provides for the construction of facilities which would benefit the nation as a whole rather than merely a local area. The second avoids the wasteful

situation where a facility which has been returned to Federal administration would be permitted to deteriorate to a "minimum" level regardless of its present level of development.

4. The Secretary of the Army should be authorized to acquire lands or interests in lands, by condemnation or other means, for recreation, fish and wildlife enhancement, including public access routes across contiguous lands, at any existing or future WRDP under his control.

5. The present general authority to lease concessions at projects under the Secretary's control should be clarified and defined with the objective of encouraging major private investment in facilities when consistent with coordinated WRDP master plans. A special fund should be created with the new revenue produced by the capital intensive concession units to help finance facilities and programs for recreation and conservation at WRDPs nation-wide.

It is recommended that the Secretary of the Army be granted the same authority, with respect to concessions at WRDPs under his control, which presently applies to areas administered by the NPS, and that 25% of all monies collected from agreements executed under such new authority shall be disbursed to the states in which such projects are situated to be expended for public schools or the general operation of county government. The remaining 75% would be expended by the Secretary of the Army for recreation and fish and wildlife purposes in the Corps WRDP system.

6. The Secretary of the Army should be directed to protect the integrity of water quality at WRDPs under his control through negotiations, and where necessary, application for injunction to the U. S. District Court which has

jurisdiction over the WRDP in question. A second device to combat some problems attributable to use of contiguous land would be a grant of authority to the Secretary to enter into cooperative agreements with local agencies for the construction of sewage treatment plants in excess of project needs, on the condition that a local agency bear the additional costs involved.

This concurrent authority is proposed to ensure that the Secretary of the Army will have adequate authority to protect water quality at Corps WRDPs in the event a given project is threatened by pollution, but a remedy is not immediately available due to the low priority of the project within the U. S. Environmental Protection Agency's national program for clean water.

Where a statewide planning and zoning mechanism exists controls over use of contiguous land necessary to prevent degradation of WRDPs should be specified and enforced by the cognizant state agency.

7. A number of non-Federal grantees find it difficult to finance the administration of fish and wildlife facilities. One cause of this problem is the present interpretation of section 460d of Title 16 which restricts the application of proceeds from the sale of timber or crops, raised on an outgrant to the development, conservation, maintenance, and utilization of the outgrant. Presently, grantees may not apply any proceeds to the overhead incurred in the administration of an outgrant. This problem would be rectified by a minor amendment to 16 USC §460d which would indicate that maintenance is defined to include a proportionate share of administrative overhead.

8. Section 3(b)(1) of the Federal Water Project Recreation Act, as amended (16 USC §460l-14), which requires a non-Federal public body to agree to administer a facility and bear not less than one-half the cost of construction for recreational facilities and not less than one-quarter the cost for fish and wildlife facilities, should be amended to the effect that the provisions shall not be applied retroactively to projects the construction of which had been commenced prior to the enactment of that Act.

B. Internal Improvements

1. Professional Staffing

Resource management today must be multi-disciplinary. Landscape architects, recreation specialists, civil engineers, economists and marketing experts, sociologists, physical educators, ecologists, architects, hotel and motel managers, and others make valuable contributions to the field. Fish and wildlife is no longer the exclusive realm of the biologist.

These are professional disciplines. They are important to the success of each public and private enterprise. To attract and retain such professionals, the Corps must have a well-defined program of recreation and resource management that has an impact upon agency policy, is respected in the field, and offers opportunities for satisfying career development.

The present Engineer District and field staffs are relatively immobile. Upward movement is restricted by low grade ratings, there are few opportunities to move laterally among WRDPs in the Corps system, and there is little two-way movement between the Engineer District offices and the WRDPs.

Professional people should be moved from field to office to field in different Engineer Districts. Those persons with Corps recreation-resource management experience should be the nucleus for staff expansion.

Entry and supervisory grade levels should be raised. Entry level rangers at GS-5 were found at surveyed WRDPs; resource managers are, for the most part, GS-9 and GS-11; the chiefs of recreation-resource management in the Savannah and Nashville Engineer Districts are GS-12 and GS-13, respectively. These are below comparable positions in the USFS supervisor and district offices visited.

Recruiting professional level resource and people managers at less than GS-7 is inconsistent with Federal agency practice. Professional entry should be GS-7 (probationary) with advancement to GS-9 after the probationary-training period. Recreation-resource management chiefs at the GS-14 level would not be inappropriate.

In-service training is important. Professionals recruited from other agencies or from universities must be acquainted with the multiple use land and multi-objective water management that is unique to the WRDP system.

Corps WRDP facilities are maintained by permanent Corps project personnel augmented by contractors and temporary personnel. The fact that these facilities are, with rare exception, clean and well maintained indicates that this work force is generally adequate.

The ranger and supporting sub-professional technician force was found to be inadequate in number. The shortage is

difficult to quantify because the character of work performed is varied. At WRDPs in or adjacent to urban areas or which receive very heavy visitation, ranger work resembles a police unit. At WRDPs with extensive remote segments, ranger work can concentrate upon resource management. The purely law enforcement aspects of Corps recreation-resource activities were not a purpose of this inquiry. It can only be assumed that a portion of the badly needed police-type support is provided partially by professional resource people (filling the same type role as NPS park rangers or USFS district rangers) and partially by persons with desire for law enforcement careers (such as the NPS Park Police and Corps policemen in the national capital area).

The case studies clearly show the need for an augmented natural resource management capability. The success of the wildlife biologist unit at Cumberland and the excellent forestry programs at Clark Hill that recorded nearly $.5 million in timber sales in FY 1974, are indicative of the enhanced fish, wildlife and productivity possible at WRDPs when the resources are professionally managed. The need for additional professional staff applies equally to the district and WRDP staffs.

No professional standards are in use by any agency to calculate the number of professionals needed per unit of acreage, per unit of recreation facility supervised, or per unit of visitation. USFS and NPS base their staffing on workload analysis. Resource management workloads at USFS ranger districts have been under some study for decades and records for timber volume handled and range livestock grazed under permit are available to evaluate personnel needs.

An additional difficulty in forecasting Corps needs for professional resource-recreation managers is the variability in distribution and organization of resource managers and staff between the Engineer District office and in the field. This variability is illustrated by comparisons of the Savannah Engineer District and the Nashville Engineer District. The Savannah Engineer District recreation-resource management branch has two professionals; Clark Hill is staffed with 11 professionals and Hartwell is staffed with six professionals. The field organizations at Clark Hill and Hartwell are in a line and staff arrangement where the staff persons are foresters and biologists and the line persons are rangers. The Nashville Engineer District recreation-resource management branch has seven professionals; J. Percy Priest, Old Hickory, Cumberland, and Cordell Hull are staffed by 25 professional biologists organized in line structure who report to a resource manager at each of the WRDPs.

Evidence developed by the National Recreation and Park Association (NRPA) indicates that one ranger is needed for every 250,000 visits. Based on 339.1 million visits in 1973, a total force of 1,360 rangers would have been required. Instead, in 1973, there were only 310 permanent rangers and 516 temporary rangers. If the temporary rangers worked during the 3-month peak season, the total force for 1973 would be 439 rangers or 921 less than was required.

If visitations increase annually at the 1972/1973 rate of 5%, there will be 430 million visits in 1978 requiring 364 additional rangers for a total additional ranger force of approximately 1,300.

The increase in professional staff will perform more effectively if project staffs are dispersed within the WRDPs. Fourteen of the 29 WRDPs surveyed would benefit from rangers stationed away from the control structure. Thus, ranger stations should be built at the same pace as staff is increased.

2. Corps Organization

The recreation-resource management responsibility at OCE, Engineer Division, and the overwhelming majority of Engineer Districts exists as either a branch or section within the operations division. At the Engineer District level, resource managers must rely on personnel from planning and engineering divisions for master planning (including land use planning), site planning, and for the design of facilities, and upon personnel from the Real Estate Directorate for the selection and supervision of lessees. These resource managers are also faced with a wide variability in the WRDP staff. In some Engineer Districts, the WRDP staffs have good depth and capability, while in others, they are sub-professional in capability and limited in number.

This management structure is a major cause of inefficient recreation, fish and wildlife, and land management at Corps WRDPs. Additionally, it is a poor vehicle to achieve the career development mobility within the recreation-resource management function.

Instead, the creation of a recreation-resource management division in the Civil Works Directorate should be considered. Such a division would draw into one organization that would be repeated at each of the three major

levels of command within the Corps the multi-disciplinary expertise needed to manage natural resources and provide recreational opportunities. It would build upon the small existing recreation-resource management staffs at the OCE, Engineer Division, and Engineer District levels. To these cadres would be added environmental resource, master planning, and recreation planning elements from the engineering and/or planning divisions and the management element of the Real Estate Directorate.

Such a division would: (1) provide the flexibility needed at the project level to organize the ranger force and the management force, and at the Engineer District level to organize the master plan force, resource management force, and the realty force in staff-line relationships appropriate to the workload; (2) provide the structure to encourage vertical professional staff mobility from entry ranger level to division chief; and (3) locate the responsibilities for recreation and the protection of environmental quality at a level suitable for District Engineer decision making. Further, the division would facilitate relationships with other resource management agencies with respect to both expanding and improving the existing outgrant system and developing cooperative, area-wide resource management programs.

Additionally, a coordinated internal training program, including personnel exchanges among the Corps, NPS, USFS, and USF&WS, and an augmented ranger and resource manager staff would improve Corps recreation and fish and wildlife performance.

Replication of this organization in all Engineering Districts may not be necessary or desirable. District recreation-resource management services could be centralized in the same way single Real Estate Directorate Offices provide civil and military services in more than one Engineer District. As a corollary to the reorganization, the RRMS and FRD automated information systems should be consolidated. The result would be a more accurate and more useful system for management.

3. Budgeting

Budget requests for the recreation-resources management function would be enhanced by use of a system that showed the relationship of increments of output to increments of input. The Texas system of zero-based budgeting format would facilitate the preparation of a yearly balance sheet reporting the economic goods and services produced by WRDP lands and waters.

4. Master Planning

WRDPs exhibit conditions, problems, and solutions that require special approaches to resource management. Each of the 29 WRDPs examined during this study profoundly altered existing natural resource systems and patterns of resource use. Only one project of the 29 (the Chesapeake and Delaware Canal) was not a part of a more comprehensive program to stabilize water levels in rivers and lakes.

One cause of the recreation and fish and wildlife enhancement problems at Corps WRDPs is the failure of the master plan process. The master planning process should begin by establishing the objectives for the management of a WRDP and then continue periodically to measure conditions

Establishing the objectives for a WRDP requires inventorying the carry capacity of that WRDP and those other WRDPs geographically located so as to form a single area available for satisfying recreation-resource demands. Next, the gross future demands for recreation-resource goods and services in the overall area must be estimated. Through a process of comparing the available supply within the overall area to the expected demands, the objectives for each of the WRDPs can be selected. Choices would be made, for example, as to committing all or part of a particular WRDP to intensive recreation development, moderate dispersed development, or to minimal development as a function of the supply of resources and the demand upon them in the overall geographic area.

The steps outlined should be integrated with the continual refinement of state and regional comprehensive plans. Examples are: state comprehensive outdoor recreation, transportation, and fish and wildlife plans; state and/or regional water quality plans mandated by Section 208, Federal Water Pollution Control Act Amendments of 1972 (§404, 33 USC §1344) and state plans prepared pursuant to the Clean Air Act (42 USC §1857f); and state mandated local land use and zoning plans. Integration with the states, regions, and localities will not be easily accomplished because of differences in methodologies, standards, and objectives. Perceptions of priority needs identified by jurisdictions, however, may shift Corps objectives at individual WRDPs; and Corps policy decisions may effect state calculations.

At any rate, the establishment of management objectives for each WRDP should be considered a major Federal action under the National Environmental Policy Act of 1969 (42 USC §4332) so full disclosure and public participation as required by the Act as well as a formal coordination as required by the Intergovernmental Cooperation Act of 1968 are made part of the planning process.

Once management objectives are chosen, alternative designs for allocating land to recreation and wildlife enhancement can be formulated. A WRDP chosen for intensive development could emphasize people management and provide for heavy involvement of concessioners and developers of contiguous lands for the provision of all feasibily marketed services, state development and operation of complementary facilities, and Corps maintenance of minimum basic access; a WRDP chosen for extensive development could emphasize habitat management and provide primative camp sites, foot trails, and unpaved vehicle access roads. Transfer of all or part of the WRDP to state and/or Federal agencies could be considered at this time.

The provisions of the master plan would extend to all water and land in the WRDP biophysical impact area. In the process, all WRDP lands, except necessary project operations land, would be allocated to recreation, fish and wildlife, or forestry after the first five-year period -- no further outgrants for "interim" uses. The master plan would detail five-year action programs for all involved agencies and jurisdictions. The agreed upon actions should become part of the appropriate state, regional, and local plans and programs.

Particular note should be taken of fish and wildlife management. Findings of this study include: "The water bodies and shorelands of the Corps WRDP system are, for the most part, man-created environments which can be managed more intensively for fish and wildlife production than is now the case"; "Responsibility for fish and wildlife management is divided between the Corps and state and other Federal agencies with no clear leadership role established"; and "All WRDP lands, except those needed for project operations and those outgranted as parts of the national wildlife refuge system are subject to state seasons, bag limits, and enforcement of state fish and game laws and regulations. This provision of law is not always formalized except when all project lands are outgranted to a state fish and wildlife agency subject to multiple use of specific parcels by the Corps or other agencies. Outgranting parcels to a state fish and wildlife agency implies that only those parcels have value for fish and wildlife, which is not true". (Some 5.1 million acres of Corps WRDP lands are open to public hunting.) The planning process outlined recognizes the primacy of the USF&WS with respect to migratory waterfowl and endangered species and of the primacy of the state fish and wildlife agencies with respect to all other species. Recognition of leadership for species management on all WRDP land should not, however, absolve the Corps from responsibility in realizing the full fish and wildlife potential of WRDP land. The agumented wildlife staff recommended above would conduct counts and habitat surveys, make the data available to fish and

wildlife agency personnel for planning and management purposes, plan and perform habitat improvement projects in keeping with the jointly approved master plans and annual work programs, offer assistance to the fish and wildlife agencies managing those lands designated exclusively and outgranted for wildlife management, and, importantly, represent the interests of fish and wildlife in internal Corps budgeting and programming activities.

At least each 5 years (as is now Corps policy), the master plan would be updated. The benefits derived from alternative water levels and timing of the water levels for recreation, fish and wildlife, and other authorized purposes would be calculated from the current data base. Changes in Federal policy, land use downstream, regulatory structures on the river, and many other factors may change the relationship of downstream benefits to on-site benefits and the updated master plan would state the new operating constraints as well as detailed proposals for people and resource management in the ensuing five-year period. Some of these issues and an approach to analyzing them have been explored at the Tenkiller Ferry WRDP.[a]

In this process, inefficient, small Corps operated facilities could be phased out in favor of larger, more efficient facilities that can return a larger portion of operations and maintenance costs through collection of fees and charges.

---

[a]Warner, L. D., D. D. Badger, and G. M. Lage. 1973. Impact Study of the Construction and Operation of the Tenkiller Ferry Lake, Oklahoma. Oklahoma State University, Stillwater, Oklahoma.

5. Land Acquisition

Key parcels of land, primarily at low MRL ratio lakes, should be acquired to insulate Corps facilities and resources from adverse contiguous uses of land.

BEST SELLERS

FROM NATIONAL TECHNICAL INFORMATION SERVICE

NTIS

An Inexpensive Economical Solar Heating System for Homes
N76-27671/PAT 59 p PC$4.50/MF$3.00

Viking I: Early Results
N76-28296/PAT 76 p PC$2.00/MF$3.00

Energy Fact Book 1976, Chapters 1 through 21
ADA-028 284/PAT 432 p PC$11.75/MF$3.00

Security Analysis and Enhancements of Computer Operating Systems
PB-257 087/PAT 70 p PC$4.50/MF $3.00

Evaluation of the Air-to-Air Heat Pump for Residential Space Conditioning
PB-255 652/PAT 293 p PC$9.25/MF$3.00

Monitoring Groundwater Quality: Monitoring Methodology
PB-256 068/PAT 169 p PC$6.75/MF$3.00

An Air Force Guide to Software Documentation Requirements
ADA-027 051/PAT 178 p PC$7.50/MF$3.00

The Production of Oil from Intermountain West Tar Sands Deposits
PB-256 516/PAT 98 p PC$5.00/MF$3.00

Analysis of Large Scale Non-Coal Underground Mining Methods
PB-234 555/PAT 581 p PC$13.75/MF$3.00

Who's Who in the Interagency Energy/Environment R and D Program
PB-256 977/PAT 35 p PC$4.00/MF$3.00

Local Area Personal Income, 1969-1974. Volume 2: Central and Northeastern States
PB-254 056/PAT 578 p PC$13.75/MF$3.00

Feasibility of Considerably Expanded Use of Western Coal by Midwestern and Eastern Utilities in the Period 1978 and Beyond
PB-256 048/PAT 61 p PC$4.50/MF$3.00

Availability of Potential Coal Supply Through 1985 by Quality Characteristics
PB-256 680/PAT 121 p PC$5.50/MF$3.00

Flat-Plate Solar Collector Handbook: A Survey of Principles, Technical Data and Evaluation Results
UCID-17086/PAT 96 p PC$5.00/MF$3.00

HOW TO ORDER

When you indicate the method of payment, please note if a purchase order is not accompanied by payment, you will be billed an additional $5.00 *ship and bill* charge. And please include the card expiration date when using American Express.

Normal delivery time takes three to five weeks. It is vital that you order by number or your order will be manually filled, insuring a delay. You can opt for *airmail delivery* for $2.00 North American continent; $3.00 outside North American continent charge per item. Just check the *Airmail Service* box. If you're really pressed for time, call the NTIS Rush Handling Service (703)557-4700. For a $10.00 charge per item, your order will be airmailed within 48 hours. Or, you can pick up your order in the Washington Information Center & Bookstore or at our Springfield Operations Center within 24 hours for a $6.00 per item charge.

You may also place your order by telephone or if you have an NTIS Deposit Account or an American Express card order through TELEX. The order desk number is (703) 557-4650 and the TELEX number is 89-9405.

Thank you for your interest in NTIS. We appreciate your order.

METHOD OF PAYMENT

- ☐ Charge my NTIS deposit account no. _____
- ☐ Purchase order no. _____
- ☐ Check enclosed for $_____
- ☐ Bill me. Add $5.00 per order and sign below. (Not available outside North American continent.)
- ☐ Charge to my American Express Card account number

☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Card expiration date_____

Signature _____

☐ Airmail Services requested

NAME_____

ADDRESS_____

CITY, STATE, ZIP_____

Item Number	Quantity		Unit Price*	Total Price*
	Paper Copy (PC)	Microfiche (MF)		
			Sub Total	
			Additional Charge	
			Enter Grand Total	

All prices subject to change. The prices above are accurate as of 3/77 .

Foreign Prices on Request.

7-18

Clip and mail to:

NTIS

National Technical Information Service
U.S. DEPARTMENT OF COMMERCE
Springfield, Va. 22161
(703) 557-4650 TELEX 89-9405