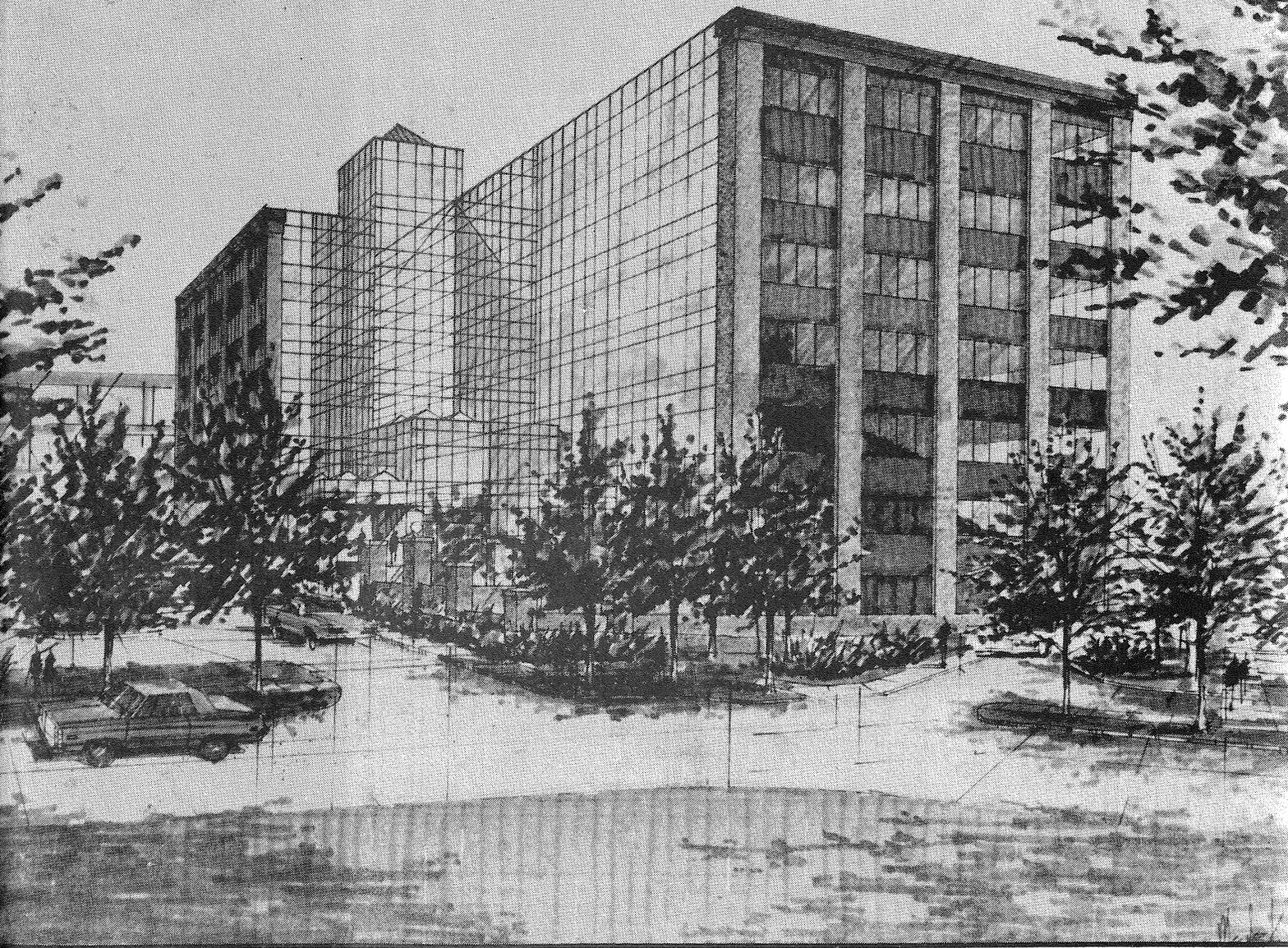


LEGISLATIVE REFERENCE LIBRARY
3 0307 00004 2997

851207

851207



Minnesota
Department
of
Natural
Resources

BIENNIAL REPORT

July 1, 1982 - June 30, 1984

This document is made available electronically by the Minnesota Legislative Reference Library as part of an ongoing digital archiving project. <http://www.leg.state.mn.us/lrl/lrl.asp>
Pursuant to Mn Stat 84.03
(Funding for document digitization was provided, in part, by a grant from the Minnesota Historical & Cultural Heritage Program.)

HC
107
M6
A33
1982/84



STATE OF
MINNESOTA
DEPARTMENT OF NATURAL RESOURCES

BOX , 500 LAFAYETTE ROAD • ST. PAUL, MINNESOTA • 55146

DNR INFORMATION
(612) 296-6157

BIENNIAL REPORT 84/85
July 1, 1985

COMMISSIONER OF NATURAL RESOURCES
Joseph N. Alexander

DEPUTY COMMISSIONER
Steven J. Thorne

ASSISTANT COMMISSIONER (Administrative Services)
Eugene Gere

ASSISTANT COMMISSIONER (Planning & Special Services)
Karen Loechler

DIVISIONS - STAFF DIRECTORS

ENFORCEMENT
Fredean Hammer

FISH & WILDLIFE
Larry R. Shannon

FORESTRY
Raymond B. Hitchcock

MINERALS
Elwood F. Rafn

PARKS & RECREATION
Donald D. Davison

TRAILS & WATERWAYS
Donald M. Carlson

WATERS
Lawrence Seymour

REGIONS - ADMINISTRATORS

REGION I (Northwest)
Merlyn Wesloh

REGION II (Northeast)
John Chell

REGION III (Central)
Robert Hance

REGION IV (Southwest)
James Schneider

REGION V (Southeast)
William Morrissey

REGION VI (Metro)
Kathleen Wallace

T A B L E O F C O N T E N T S
 MINNESOTA DEPARTMENT OF NATURAL RESOURCES
 BIENNIAL REPORT 1982-1984

DEPARTMENT DIRECTORY	1
COMMISSIONER'S PREFACE	3
TABLE OF ORGANIZATION	7
INCOME AND EXPENDITURE CHARTS	8
DEPARTMENT ACTIVITIES	
Fish & Wildlife Management	10
Fish Management	11
Wildlife Management	23
Ecological Services	33
Forest Resource Management	38
Minerals Resource Management	53
Parks and Recreation Management	64
Trails and Waterways Management	69
Water Resources Management	73
Regional Administration	85
Enforcement	88
Office of Planning	92
Information and Education	95
Minnesota Environmental Education Board	99
Land Management	101
Engineering	104
Financial Management	105
Personnel	107
License Bureau	109
Field Services	110
Management Information Systems	112
Records and Office Services	113
Office of Youth Programs	114
Volunteer Programs	115

COMMISSIONER'S PREFACE

The challenge of natural resource management is both constant and ever-changing. Only constant vigilance assures the future of our precious resources. Challenges evolve as physical, economic, social and political changes occur in our overall environment.

This Biennial Report addresses the response of the Department of Natural Resources to the challenges of the period from July 1, 1982, to June 30, 1984. Progress and accomplishment highlight this period in spite of stringent economic conditions.

The Division of Forestry has embarked on a period of continued expansion for both management and utilization of the timber resource. Sales of state timber have rebounded from the declines generated the last few years by the major slump in the housing industry. The final year of the Biennium produced sales only slightly below the all-time high of 1980.

Results of several years of seeking new markets for the historically under-utilized aspen species have created the highest ever volume of state sales of aspen. The same efforts have resulted in a tremendous surge of capital investment by the private sector totaling some \$750 million. Included are an expansion by Blandin, another by St. Regis Paper, new plants by Potlatch (two) and Northwoods as well as a yet-to-be-constructed plant by Louisiana-Pacific. These timber resources are protected by the most modern fire control and suppression program in the country. We hope to make this program even more effective by asking the Legislature for the authority to enter into cooperative compacts with neighboring states.

The Division of Minerals has been heavily involved in the first major developments affecting Minnesota's extensive peat resources. Several test burns have been conducted to evaluate energy potential. The City of Virginia has been experimenting with the use of peat for fuel in its municipal power plant. In addition, similar experiments have been conducted in two independent power plants. The Rasjo Torv Company of Sweden is involved in the first major peat mining development in the state. Our involvement with experimentation in a direct reduction iron ore processing method gives promise of great potential for the future.

The Division of Fish and Wildlife has concluded a Biennium marked by extensive innovation. Years of modification of the management of the white-tailed deer population has paid off. In just over a decade since cancellation of the deer season because of declining population, we have rebounded to the largest harvest in history in 1983 and a 1984 population which is at or near the all-time peak despite a brutal winter, which was extremely hard on wildlife.

That same winter of 1983-84 threatened to virtually destroy the state's pheasant population. It was saved from greater devastation through a tremendous statewide volunteer effort coordinated by the Department and utilizing feeding stations throughout the pheasant range. The tens of thousands of birds saved and the initiation of a pheasant stamp, which will fund new habitat programs, give promise for the future of a stable pheasant population in Minnesota. A new roadside habitat coordinator funded by the stamp revenue

will enable development of greater habitat for nesting, food, and shelter for pheasants and other species.

Resource managers and the hunting public will all benefit from a new, computerized antlerless deer permit selection system, which will eventually enable all hunters to, at sometime, receive the highly sought permits.

Fisheries management has also made great strides with increased utilization of the "Big Redd" portable incubator, which was developed within the Department. In addition, the groundwork is being developed for several intensified fish management programs to be funded by a \$2.50 surcharge imposed on fishing licenses, beginning in calendar year 1984.

Minnesota's Nongame Wildlife Program continues to be recognized as one of the foremost in the nation. Of particular note is the effort in the spring of 1984 to reintroduce the peregrine falcon to areas they once inhabited along the North Shore and along the Mississippi River in the southeast. Minnesotans continue to support this program through the Nongame Wildlife Checkoff on their tax forms, in amounts that are among the highest in the nation.

The Division of Enforcement expends much of its effort and budget in the protection of our resources, with particular emphasis on fish and wildlife resources. Major efforts of the past Biennium have been directed against the commercial exploitation of those resources. A major ally in that effort is the Turn In Poachers (TIP) Program, which is a citizen-directed and funded program to encourage the public through a reward system to provide information regarding violation of the fish and wildlife laws. The TIP Board, while independent of the Department, privately raises substantial funding through a wildlife art print program, and works closely with the Division of Enforcement to achieve its goal of reducing the number of such violations. There has been outstanding public response to the program as illustrated by a total of 1,965 calls resulting in 295 arrests in FY 83 and 1,142 calls resulting in 316 arrests in FY 84. The quality of information provided by those calls is evident from the 98 percent conviction rate. Road check programs have resulted in a large decrease in the number of violations of fish limits. The success of the deterrent value of this effort will result in its further use during waterfowl, pheasant and big game seasons.

Cooperative efforts were initiated with the Division of Forestry to establish arson investigating teams and increase awareness and enforcement of forestry laws and with the Division of Parks and Recreation to increase awareness and enforcement of those laws and regulations.

The Division of Parks and Recreation has concentrated heavily on development of the parks. Split Rock Lighthouse State Park was improved by picnic and campground development. At Itasca State Park a remodeling of the 1906 Douglas Lodge building was accomplished, as was a major rehabilitation of the park's road system, including the completion of paving of all of Wilderness Drive. Considerable maintenance and development work in the parks was accomplished by young people in the Minnesota Conservation Corps, which had ten crews working in the parks.

The Trails and Waterways Unit continued the accelerated progress of recent years. Some 125 public water accesses were developed or rehabilitated during the Biennium. Funds were dedicated for the snowmobile programs, and

the cross-country ski program began to be funded by a license fee for ski trail users.

The Division of Waters completed the first inclusive statewide inventory of protected waters and wetlands in our history. Its existence will enable landowners and others to know whether permits are required for work on wetlands or other waters.

The Shoreland Management program evaluation was completed, with significant local government participation recommending only minor changes. Fifty additional municipalities adopted shoreland ordinances during the Biennium. The evaluation revealed a significant increase in permanent rather than seasonal lakeshore development. There is also a great increase in multi-family, planned unit developments. These changes will certainly present future challenges for our lake resources.

The evaluation of our Flood Plain Management program indicated that although 250 communities have adopted flood plain ordinances, there are some 17,000 structures now in flood plain areas throughout the state. With an average annual flood damage figure of \$60 million, and increasing problems with rising lake levels, it is clear that much work remains to be done.

Major efforts have also been undertaken to determine the amount and distribution of groundwater throughout the state to provide the necessary data for future management of what may well be our most critical natural resource.

Significant progress has been achieved in the management of Minnesota's groundwater. Application of geophysical techniques shows promise as a tool to indirectly define aquifer boundaries. This is particularly important in western Minnesota, where aquifers are buried in the drift and have no surface expression. Application of computer models enables prediction of probable impacts on groundwater supplies of future development under varying climate conditions.

An important inventory was completed, involving unused wells on DNR-administered lands in southeastern Minnesota. Such wells, if left open, potentially contribute to water quality problems. They have been prioritized according to severity of the potential impact and plans are being made to properly abandon them.

Increased water-reporting fees have been used to improve statewide monitoring of groundwater levels. Twenty-five new wells have been drilled, bringing the total being monitored in cooperation with Soil and Water Conservation districts to 385. These provide valuable information to measure the response of aquifers to use and precipitation.

The Department, through its Land Bureau, is responsible for land management services on nearly 5.3 million acres of land, including school trust fund lands. Such services are also provided for the 2.8 million acres of tax-forfeited land administered by the counties. Major legislative initiatives in 1984 will increase our land base management efficiency. These include transferring from Administration to DNR the authority to sell DNR-administered surplus land and the authority to review land acquisition appraisals; establishing a revolving fund for land acquisition; and legislation involving consolidated conservation lands and ditch assessments.

The Land Bureau coordinated the payment of \$11,238,000 to counties in lieu of taxes for fiscal years 1983-84. The management information for some 5,761 leases, licenses and easements was automated and made available to field offices statewide for the first time.

Land exchange has gained increasing acceptance as a management tool. Guidelines were developed during the Biennium which will have long-range impact on future management programs. Some 49 land exchanges were completed, with the value of affected lands approaching some \$6 million. The Land Bureau provided the necessary services to complete the acquisition of varying degrees of interest in 292 parcels -- with the most numerous being for wildlife, water access sites, fish management areas and water banks.

The Department paid great attention during the Biennium to consolidating and modernizing its internal administration. Much progress has been made in developing an overall department-wide approach to management information system (MIS) needs, which was made possible by a \$600,000 grant from the Legislative Commission on Minnesota Resources (LCMR). Accomplishments include MIS training sessions for some 200 managers and supervisors, an active MIS Technical Committee to develop and review policies for MIS activities, completion of an office automation plan for the administrative service units of the Department, standardization of word-processing equipment, establishment of a word-processing training center, and installation of an IBM System 38 computer.

Throughout the Biennium, the Department worked with various legislative committees and the Department of Administration to review our statewide organizational structure. The Metro Region was abolished and re-established. Various service functions within the Central Office were brought together under a newly created Assistant Commissioner for Planning and Special Services. Planning began in early 1984 to bring the Central Office activities, housed in five separate locations, together for the first time in more than 20 years at a remodeled warehouse at 500 Lafayette Road. Our Central Office is now operational in one site to increase internal efficiency and to provide the public with one-stop access to the various DNR services and programs.

The 1983-1984 Biennium was clearly marked by modernization and progress. The challenge now becomes to fine-tune the structure to increase efficiency so that the dollars generated by taxes, fees, and licenses result in the optimum level of service to the public and management of our precious diversity of natural resources.

* * *

DNR

*COMMISSIONER
 DEPUTY COMMISSIONER
 ASSISTANT TO THE
 COMMISSIONER
 LEGISLATIVE AND REGULATORY
 SERVICES
 ADMINISTRATIVE SECRETARY

OFFICE OF THE
 COMMISSIONER*

INTERNAL AUDIT

LEGAL BUREAU

CONTROLLER

ASSISTANT COMMISSIONER
 FOR PLANNING
 AND SPECIAL SERVICES

ASSISTANT COMMISSIONER
 FOR ADMINISTRATION

BUREAU OF
 PLANNING

SPECIAL
 SERVICES

REGIONAL
 ADMINISTRATION
 6 REGIONS

BUREAUS

ENVIRONMENTAL
 REVIEW

TRAINING

VOLUNTEER
 MANAGEMENT

POLICY DEV. AND
 MGMT. ANALYSIS

AFFIRMATIVE
 ACTION

YOUTH
 PROGRAMS

DATA SYSTEMS

CITIZEN
 PARTICIPATION

MN. ENVIRON.
 EDUC. BOARD

NATURAL RES.
 PLANNING

INFORMATION
 AND EDUCATION

FINANCIAL
 MANAGEMENT

LICENSES

PERSONNEL

MGMT. INFO.
 SYSTEMS

LANDS

OFFICE
 SERVICES

ENGINEERING

FIELD SERVICES

WATERS

MINERALS

FORESTRY

FISH AND
 WILDLIFE

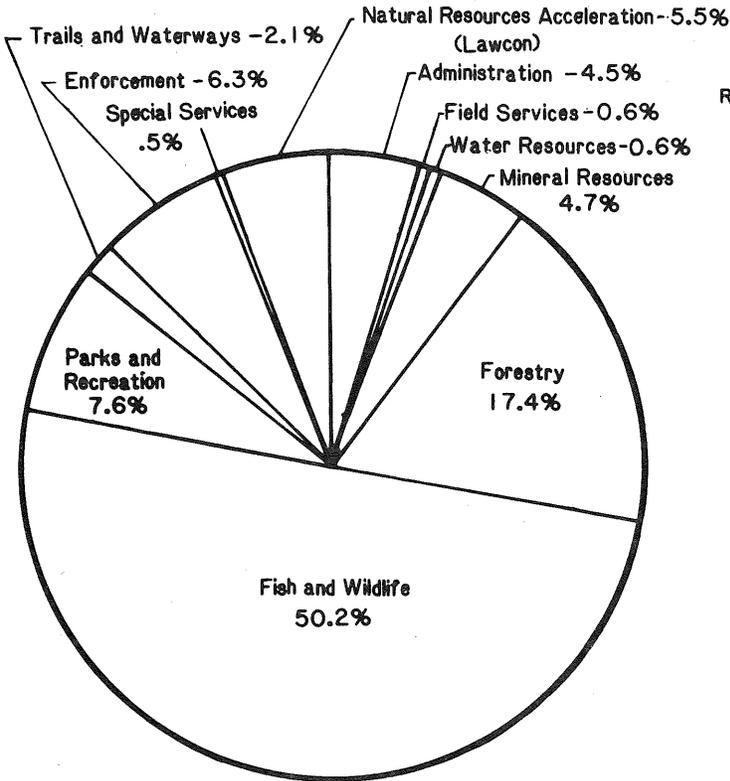
PARKS AND
 RECREATION

TRAILS AND
 WATERWAYS

ENFORCEMENT

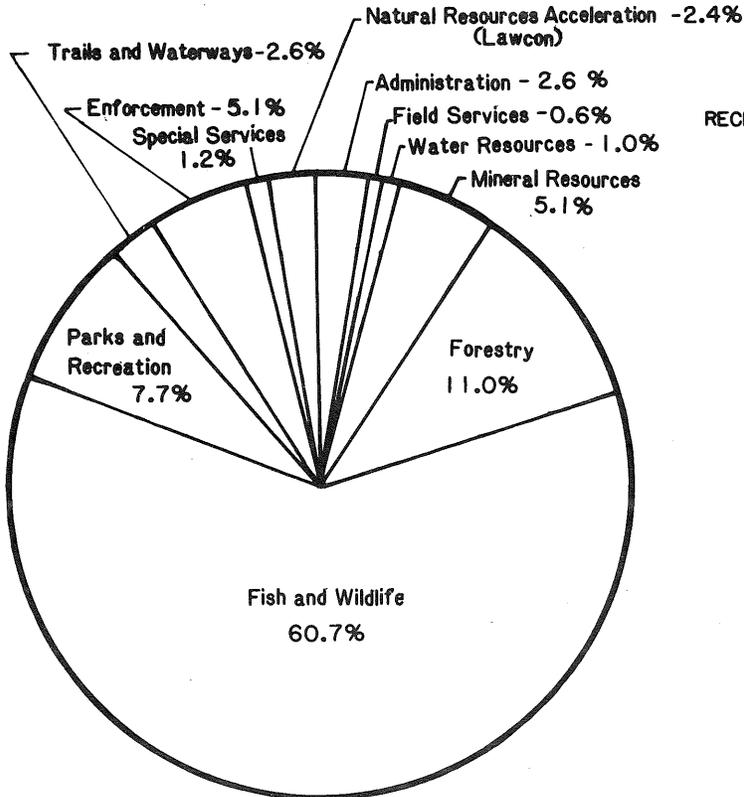


WHERE YOUR NATURAL RESOURCES DOLLAR COMES FROM



F.Y. 1983
 RECEIPTS: JULY 1, 1982 - JUNE 30, 1983
 (Actual, 000'S Omitted)

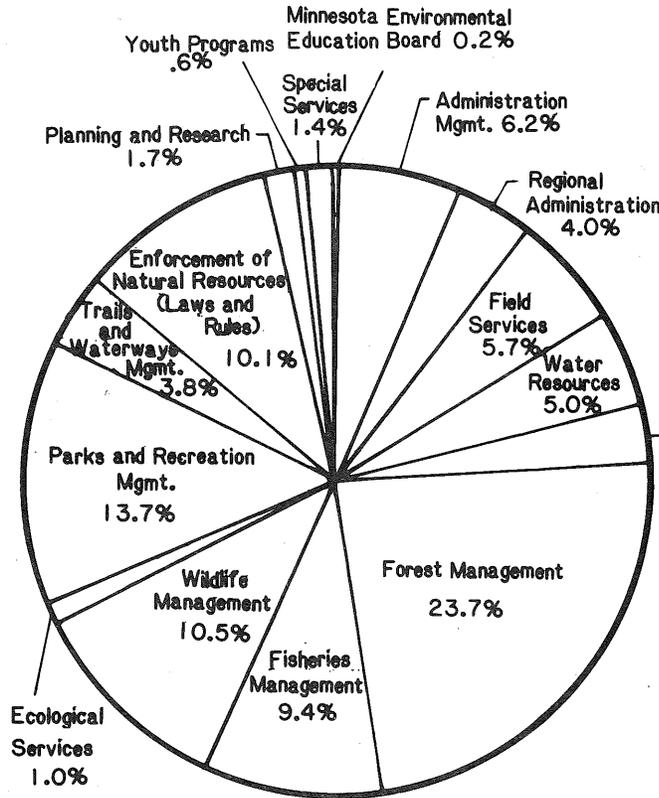
Administration	\$ 2,140.6
Field Services	286.6
Water Resources	263.3
Mineral Resources	2,236.3
Forestry	8,255.5
Fish and Wildlife	23,839.7
Parks and Recreation	3,625.8
Trails and Waterways	1,014.5
Enforcement	2,996.9
Special Services	221.5
Natural Resources Acceleration (LAWCON)	2,638.9
TOTAL	\$ 47,519.6



F.Y. 1984
 RECEIPTS: JULY 1, 1983 - JUNE 30, 1984
 (Actual, 000'S Omitted)

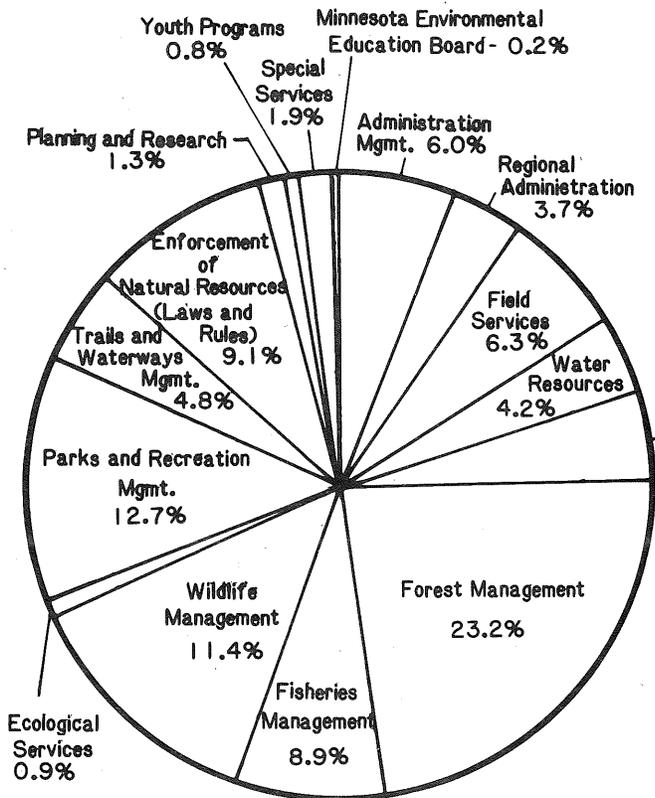
Administration	\$ 1,304.8
Field Services	297.7
Water Resources	472.6
Mineral Resources	2,531.5
Forestry	5,401.7
Fish and Wildlife	29,802.7
Parks and Recreation	3,765.9
Trails and Waterways	1,270.1
Enforcement	2,494.0
Special Services	586.6
Natural Resources Acceleration (LAWCON)	1,191.6
TOTAL	\$ 49,119.2

WHERE YOUR NATURAL RESOURCES DOLLAR IS SPENT



F.Y. 1983
EXPENDITURES: JULY 1, 1982 - JUNE 30, 1983
(Actual, 000's Omitted)

Administration Mgmt.	\$ 5,036.7
Regional Administration	3,241.0
Field Services	4,658.7
Water Resources	4,075.9
Mineral Resources Mgmt.	2,448.1
Forest Management	19,287.4
Fisheries Management	7,663.0
Wildlife Management	8,603.3
Ecological Services	797.5
Parks and Recreation Mgmt.	11,200.2
Trails and Waterways Mgmt.	3,061.5
Enforcement of Natural Resources Laws and Rules	8,276.6
Planning and Research	1,376.4
Youth Programs	500.3
Special Services	1,141.4
Minnesota Environmental Education Board	161.7
TOTAL	\$ 81,529.7 (1)



F.Y. 1984
EXPENDITURES: JULY 1, 1983 - JUNE 30, 1984
(Actual, 000's Omitted)

Administration Mgmt.	\$ 5,617.8
Regional Administration	3,522.0
Field Services	5,963.5
Water Resources	3,914.0
Mineral Resources Mgmt.	4,299.3
Forest Management	21,762.3
Fisheries Management	8,382.8
Wildlife Management	10,730.2
Ecological Services	856.7
Parks and Recreation Mgmt.	11,891.9
Trails and Waterways Mgmt.	4,479.1
Enforcement of Natural Resources Laws and Rules	8,520.5
Planning and Research	1,211.3
Youth Programs	758.1
Special Services	1,771.6
Minnesota Environmental Education Board	234.4
TOTAL	\$ 93,915.5 (1)

(1) EXCLUDES: RESOURCE 2000 (BONDING) AND EXPENDITURES FOR INDIRECT COSTS.

FISH AND WILDLIFE MANAGEMENT

The Division of Fish and Wildlife is responsible for management of fish and wildlife on approximately 5 million acres of water; more than 15,000 miles of rivers; and about 50 million acres of publicly and privately owned land, including about 1 million acres of public hunting areas. Fish and wildlife produced on this land and water are enjoyed and used by more than 3 million residents and nonresidents and have an economic impact of about \$1 billion a year on the state's economy. Minnesota's tourism industry is largely dependent on the attraction and recreational opportunities provided by fish and wildlife populations.

The goal of the Division is to protect, enhance and manage the state's fish and wildlife resource to maintain social and economic benefits to be derived from the resource by present and future generations.

A challenge of the remainder of the '80s (and the '90s) will be to maintain this resource in the face of greater demands by recreationists and competing uses of the habitat base by other interests. It is essential that the fish and wildlife resource be recognized for its contribution to the economic and social well being of the state, and that an adequate funding base be provided to carry out necessary management activities. The funding base needs to be expanded to include more than the traditional license revenue sources if the Division is to provide for needs of the '80s and '90s, and especially if expanded state tourism promotion results in greatly increased participant pressure on the fish and wildlife resource.

The following summarizes the major work accomplishments during FY 83 and FY 84 of the Division's three sections -- Fisheries, Wildlife, and Ecological Services.

FISH MANAGEMENT

A large part of Minnesota's wealth lies in the state's 5,000 lakes totaling 3.6 million acres of fishing water, and 15,000 miles of fishing streams. They provide fishing recreation for more than 2 million anglers annually.

Management of this resource is the responsibility of the Section of Fisheries, whose field force operates from six regions and 27 area offices. It is accomplished through the protection of habitat, the improvement of habitat for game fish, propagation and distribution of fishes, control of rough fish, and rehabilitation of lakes. An extensive survey program is maintained to provide current information on the status of fish populations as the basis for the distribution and evaluation and research efforts of management.

A fisheries research program provides applied research on the development of new management methods, improves techniques, and supplies the basic information for understanding fisheries resource problems.

Physical habitat development is preceded by obtaining control of fish management sites, either through the purchase of the land in fee title or by acquiring perpetual easements for the necessary rights of access and development. Habitat protection is accomplished through coordination with the Minnesota Department of Transportation, Corps of Engineers, Environmental Quality Board, U.S. Fish and Wildlife Service and DNR's Division of Waters. Other measures involve the prevention of rough fish migration into good fishing waters and the restoration or redevelopment of lost spawning area.

Also very important are public participation meetings and the training and development of personnel. The section provided a training opportunity for all permanent personnel in 1983, and a conference in 1984 for supervisory personnel, which addressed management philosophy, surveys of angler attitudes, inter-divisional coordination and new programs. In the winters of both years, 18 public meetings were held statewide to obtain public input and to provide for a question and answer session with the public.

The lake information files were computerized during this period. The development of a Lake Information Data Base resulted in a management tool for Fisheries and an information service for the public. The data base was used at the State Fair for two years and at the Midwest Sports and Travel Show. Thousands of lake printouts regarding the physical, chemical and biological qualities of their favorite lakes were given to the public.

A committee of managers and researchers worked out a framework for a long-range plan. The committee used input from the professional staff and expertise from the DNR Office of Planning to recommend section organization changes as well as a framework for planning.

Habitat Protection and Development

Fish are prolific animals capable of maintaining themselves in adequate numbers where they are living in suitable habitat. One of the most important thrusts of the fish management program is aimed at protecting and improving habitat through acquisition and the Department's statutory authority over prior cross-section of beds of public waters, and through coordination with the U.S. Department of Transportation, U.S. Corps of Engineers, Minnesota Environmental Quality Board, and U.S. Fish and Wildlife Service. Other measures involve the prevention of rough fish migration into good fishing waters, and the restoration or redevelopment of lost spawning areas.

Land Acquisition

Acquisition of land by the Section of Fisheries is confined to the purchase of perpetual easements and fee titles on corridors along trout streams, on sites for northern pike spawning areas and for the construction of rough fish control devices. The easements (or fee titles, in a few cases) on trout streams allow public fishing and stream improvement work by fisheries crews. Most effort during the Biennium was to acquire intervening stretches to consolidate access on streams. New stream areas are planned for acquisition when funds are available.

Purchases by fee title or easement are made for tracts which provide natural northern pike spawning areas, or areas where water levels can be controlled in spring to provide uniform spawning conditions each year.

Land control for construction of rough fish barriers and traps is obtained at strategic locations on lake outlets and on marsh outlets adjacent to lakes. An effective method for controlling rough fish populations is to stop their movement into lakes and to deny them their best spawning areas (marshes).

Seventy-five percent of the costs for trout streams and northern pike spawning areas are reimbursable to the Game and Fish Fund through provisions of the federal Dingell-Johnson Act administered by the U.S. Fish and Wildlife Service.

Trout streams -- Easements optioned or purchased:

<u>Location</u>	<u>Parcels</u>	<u>Stream Miles</u>	<u>Cost</u>
Fillmore County	5	1.12	\$ 33,255
Winona County	4	2.92	59,210
Houston County	1	.68	13,750
Pine County	1	.50	6,710
St. Louis County	3	.57	42,700
Lake County	7	3.00	82,335
Cook County	1	.57	4,560
Becker County	1	.85	4,150
Totals	<u>23</u>	<u>10.21</u>	<u>\$246,670</u>

Trout streams -- Easements in negotiation:

<u>Location</u>	<u>Parcels</u>	<u>Stream Miles</u>	<u>Cost</u>
Carlton County	1	.07	\$ 1,000
Goodhue County	3	1.32	23,800
Lake County	4	3.23	69,808
Fillmore County	1	.66	17,000
Houston County	3	1.07	24,550
Pine County	2	1.50	26,950
St. Louis County	4	.79	22,825
Winona County	1	1.09	23,000
Totals	<u>19</u>	<u>9.73</u>	<u>\$208,933</u>

Spawning areas -- Optioned or purchased:

<u>Location</u>	<u>Parcels</u>	<u>Sites</u>	<u>Acres</u>	<u>Cost</u>
Scott County	3	2	44.3	\$ 91,800 (2 fees, 1 easement)
Meeker County	2	1	18	12,250 (1 fee, 1 easement)
Totals	<u>5</u>	<u>3</u>	<u>62.3</u>	<u>\$104,050</u>

Spawning areas -- in negotiation:

Cass County	1	1	.4	16,000 (fee)
Kandiyohi County	3	2	21.6	21,178 (easement)
Scott County	1	1	5.9	2,700 (easement)
Totals	<u>5</u>	<u>4</u>	<u>27.9</u>	<u>\$ 39,878</u>

Rough fish control sites -- optioned or purchased:

Douglas County	4	4	8.4	\$ 6,650
----------------	---	---	-----	----------

Stream Improvement

Habitat improvement work is undertaken on trout streams to prevent bank erosion, provide more fish shelter, improve spawning conditions, and provide fishing and stocking access trails. The work is carried out on stream lengths where easements to Fisheries have been obtained. One of the important projects on the streams in the Lake Superior drainage system involves modifying natural barriers (waterfalls or cascades) by making step-pockets to provide upstream passage for adult trout and salmon at spawning time, thereby providing more stream length for spawning and for increased production of wild fish.

Seventy-five percent of the costs for the inland trout stream work are reimbursable to the Game and Fish Fund through the federal Dingell-Johnson Act. Fifty percent of the costs for the anadromous stream work is reimbursable to Fisheries through the Aid to Anadromous Fisheries Act administered by the U.S. Fish and Wildlife Service.

Work was carried out on six different anadromous streams, which benefited three miles of streams. Work was done on 23 different inland streams, which benefited 51 miles of streams.

Development (Contract Construction)

Two rough fish barriers and one rough fish trap have been constructed in Douglas County, as part of the cooperative wildlife improvement project with the U.S. Department of Soils Conservation. One state-owned dam was repaired. A work-storage area at a Fisheries station was winterized and a northern pike spawning area at Ely was reshaped for improved efficiency and greater production.

Development (Fisheries Construction Crew)

Habitat improvements:

- * Rough fish barrier reconstruction -- Lake Rebecca, Hennepin County
- * Rough fish barrier improvement -- Eagle Lake, Carver County
- * Rough fish barrier improvement -- Hydes Lake, Carver County
- * Dam repair -- Gorman Lake, LeSueur County
- * Dam repair -- Lake Sakatah, Rice County
- * Dam repair -- Block Lake, Kandiyohi County
- * Dam and control structure repair -- Mud-Goose Waterfowl Area, Cass County

Fish production improvements:

- * Reconstruction of four raceways -- Crystal Springs Trout Hatchery, Winona County
- * Facilitate spring water use -- Spire Valley Trout Hatchery, Aitkin County
- * Reconstruction of sewer and water lines -- Glenwood Station
- * Pond clean-out -- Glenwood Station
- * Northern pike spawning area repair -- Eagle Lake, Hennepin County
- * Walleye pond repair -- Cove Bay 2, Mille Lacs Lake, Mille Lacs County

Public accesses:

- * Construction of 894 concrete planks for use statewide on boat ramps.

Development (Area Personnel)

Habitat improvements:

Rough fish barrier improvements --

Banke Slough -- Douglas County	Clear Lake -- Meeker County
Hattie Lake -- Stevens County	Lake Rebecca -- Dakota County
Winsted Lake -- McLeod County	Glacier Pond 1 -- Itasca County

Habitat structures:

- * Fish shelter structures -- Wampus and Poplar Lakes, Cook County (operative)
- * Fish shelter structures -- South Twin Lake, Beltrami County

Improved facilities for fish production:

- * Construction of fish-holding facility -- Bemidji, Beltrami County,
- * Spawning area vegetation control -- Grace Lake, Itasca County.
- * Northern pike spawning area improvement -- Lake Mille Lacs, Aitkin County
- * Reservoir clean-out for improved salmonid run -- French River, St. Louis County
- * Water line repair for rearing facilities -- French River, St. Louis County
- * Raceway construction for salmonid rearing -- French River, St. Louis County

Lake Rehabilitation

Lakes that have become over-populated with rough fish, or those that are suitable for trout but contain populations of incompatible species, are considered candidates for chemical rehabilitation, provided the body of water can be isolated from re-entry of unwanted fishes by barriers to migration. In the process of rehabilitation, the existing fish population is eradicated with certain chemicals (approved by the U.S. Environmental Protection Agency) and restocked with the desired game fish combination. In addition to providing good fishing, this procedure also benefits boating, swimming and waterfowl hunting.

One of the two chemicals (Fintrol) used in Minnesota and federally approved has not been produced in sufficient quantity until recently to supply state agencies. This has limited the rehabilitation program because of the logistics problem of treating remote lakes with rotenone, the more bulky alternative. Two warm-water lakes with areas totaling 229 acres and eight trout lakes totaling 276 acres were treated during the Biennium. These projects were reimbursed 75 percent by the U.S. Fish and Wildlife Service, under provisions of the Dingell-Johnson Fish Restoration Act.

Lake and Stream Management Planning

A program of individual waters planning was initiated during the Biennium. The "Lake Management Planning Guide" (Special Publication No. 132) was completed June 1, 1983. An extensive workshop training program was brought to all regional and area Supervisors. This made a comprehensive program from the lake and stream inventory. This program requires managers to prioritize their lakes to identify the largest, most heavily used waters and requires a lake fisheries management plan to be written for each of them, with a goal, objectives, operational plan, potential plan (should additional money be available) and a narrative describing past management limiting factors, management direction and evaluation plans for each lake. The lake plan, inventory, fish population assessment, evaluation and re-planning will improve management abilities and allow for an orderly movement of supervisory personnel from station to station without losing the knowledge gained by prior incumbents.

During the Biennium, a sampling guide to format the investigation of large walleye lakes was also developed. Mille Lacs Lake sampling was carried out for two years using the format; Cass, Leech, Kabetogama, Rainy, and

Winnibigoshish were done once each. This monitoring will provide the in-depth data to individually manage our nine lakes over 26,000 acres (1,066,000 acres total) and Lake Superior (1,300,000 Minnesota acres).

The lake and stream management planning program accomplished the following: area-prioritized lake list, 271 lake management plans, 456 initial surveys or re-surveys, 805 population or reproduction assessments, 864 dissolved oxygen tests, 13 creel surveys, a recreational use survey of 8 lakes, and an aerial ice-house count survey.

On streams, the following was accomplished: 88 surveys, 9 anadromous stream management plans, 167 population or reproduction assessments, a North Shore spring creel census and a southeastern Minnesota creel census on 3 streams.

This lake and stream management planning work is reimbursable from the Dingell-Johnson Act (Sport Fish Restoration Act) and Anadromous Fish Conservation Act.

Production and Distribution

Each year, fish from state hatcheries, rearing ponds, and rescue sites provide stocks for some 1,300 public fishing waters where facilities for natural production of certain species are lacking, or where current local conditions have been unfavorable. Included are about 132 managed stream trout lakes and 1,900 miles of trout streams that are stocked annually.

Anadromous trout and salmon represent one of the most important renewable fishery resources in Lake Superior. Because of the limited spawning success of natural runs of salmon and steelhead, the success of this program has depended significantly on the contributions of hatchery-reared fish. Enhancement of the trout and salmon resource through hatcheries is presently a major strategy for the management of salmonid stocks. Recent introduction of Pacific and Atlantic salmon has added greatly to the recreational resources of Lake Superior.

The walleye is the "king of Minnesota fishes," and the state is renowned for its walleye fishing. In fact, Minnesota leads the nation in the production and stocking of this popular species. The largest single fish management activity in this state continues to be artificial propagation of walleye. Annually we take between 450 million to 566 million eggs.

A relatively new program is the propagation of catfish for waters of southern Minnesota. Altogether, the southern part of the state has approximately 995,480 acres of lakes that are 10 acres in size or larger, of which 21.3 percent are classed as fish lakes. Approximately 212,037 acres have a potential as catfish water. There are also numerous warm-water streams that constitute several hundred miles of available water for catfish management.

Besides the fish listed in the table following, which were produced in state rearing facilities, federal hatcheries and other states have made additional contributions to enhance Minnesota's fisheries programs. Most significant of these contributions were more than 400,000 lake trout for northern lakes and over 71,000 catfish for inland lakes and streams of southwestern Minnesota.

Following are the numbers of fish, by species and sizes:

July 1, 1982, to June 30, 1984

<u>Species</u>	<u>Adults</u>	<u>Yearlings</u>	<u>Fingerlings</u>	<u>Fry</u>
Walleye	11,496	475	5,360,957	734,420,248
Northern pike	17,011	38,465	2,506,656	
Muskellunge			29,474	
Largemouth bass	41	3,654	128,438	3,000
Smallmouth bass			74,046	
Channel catfish			55,595	
Flathead catfish			29,917	
Crappie	62,674.5	42,483		
Sunfish	84,220.5	21,877	2,028	
Perch	12,022	31,864		
Brown trout	15,947	168,582	274,919	1,197,907
Rainbow trout	1,988	289,545	1,362,671	1,022,025
Rainbow (steelhead)		6,000		1,139,796
Brook trout		98,818	410,336	350,755
Lake trout	2,342	763,339	437,921	
Splake			151,112	
Atlantic salmon	695	29,818	2,463	35,138
Chinook salmon			743,871	417,675
TOTALS	208,437	1,494,920	11,570,404	738,235,789

Commercial Fisheries

The commercial fishing industry of Minnesota encompasses ten discrete fisheries. They are: Inland, Lake Superior, Interstate, International, Inland Mississippi River, Minnesota-Mississippi River Set Line, Turtle, Frog, Private Fish Hatchery and Live Bait. Contact with each fishery is maintained through licensing, production reports, personal communication and annual business meetings. In this reported Biennium, frog data is omitted because commercial harvest has been prohibited by Commissioner's Order No. 1912. Live bait and the new fishing tournament data are displayed separately.

This highly regulated and monitored industry provides data that benefits the resource, provides food for public consumption and provides income for the fisherman. All harvesting participants of the major commercial fisheries are required to report their production prior to annual re-licensing. Information gleaned from these reports is analyzed and submitted to state fisheries resource managers for consideration when regulation or management decisions are formulated.

Commercial fish production during the Biennium totaled 17,580,247 pounds, worth an estimated \$3,525,618 and involved an average of 776 licensed participants per year. This amount of production suggests 8,375,750 meals for consumers. Inedible by-products of the food processing system are used in fertilizer, fish meal and fish oil, among other products. The following tables show data by year:

Commercial Fisheries Data for 1982

<u>Fishery</u>	<u>No. Licensed Fishermen</u>	<u>No. of Helpers</u>	<u>No. of Permits</u>	<u>Pounds of Harvest</u>	<u>Value of Harvest</u>
Inland	25	196	77	5,343,916	\$ 846,508
Lake Superior	46	34	10	382,634	155,398
Interstate	129	88		827,907	93,786
International	22	23		1,366,013	339,709
Inland Mississippi River	3	6		122,476	11,086
Minn.-Miss. River setline	3				
Turtle	56			42,955	18,506
Private Fish Hatchery	45			138,720	153,780
Total	328	347	87	8,224,621	\$1,618,733

Commercial Fisheries Data for 1983

<u>Fishery</u>	<u>No. Licensed Fishermen</u>	<u>No. of Helpers</u>	<u>No. of Permits</u>	<u>Pounds of Harvest</u>	<u>Value of Harvest</u>
Inland	27	191	164	6,698,348	\$1,020,713
Lake Superior	42	27	9	484,089	172,656
Interstate	117	55		753,937	71,234
International	22	19		1,063,389	371,090
Inland Mississippi River	3	14		90,420	7,440
Minn.-Miss. River setline	3				
Turtle	52			40,335	16,134
Private Fish Hatchery	45			225,108	247,618
Totals	311	306	173	9,355,626	\$1,906,885

The live bait industry overwhelms all other commercial fishing entities of the state. This industry provides a very important support service to the anglers in Minnesota. Minnow and leech bait production for the Biennium totaled 1,023,169 gallons, worth an estimated \$48,703,649 and involved an average of 2,755 licensed participants per year. The following tables show data by year.

Live Bait Data for 1982

<u>License</u>	<u>No. of Licenses</u>	<u>No. of Helpers</u>	<u>No. of Vehicles</u>	<u>Gallons of Minnows</u>	<u>Gallons of Leeches</u>	<u>Value of Harvest</u>
Retailer	1,240		209			\$15,309,412
Dealer	442	895	681	226,680	26,150	4,315,450
Exporter	38		71	150,614	725	3,044,905
Non-Res. Hauler	18		17	48,193	2,751	832,935
Fish Hatchery	47			73,719		1,842,975
Hatchery (sucker eggs)	44			5,667 Qts.		170,010
Total	1,829	895	978	499,206	29,626	\$25,515,687

Live Bait Data for 1983

<u>License</u>	<u>No. of Licenses</u>	<u>No. of Helpers</u>	<u>No. of Vehicles</u>	<u>Gallons of Minnows</u>	<u>Gallons of Leeches</u>	<u>Value of Harvest</u>
Retailer	1,260		206			\$13,880,377
Dealer	471	914	673	222,636	15,206	3,871,750
Exporter	36		82	111,524	1,720	2,307,880
Non.-Res. Hauler	23		23	62,507	914	974,165
Fish Hatchery	45			79,830		1,995,750
Hatchery (sucker eggs)	38			5,268 Qts.		158,040
Total	1,873	914	984	476,497	17,840	\$23,187,962

The competitive spirit exhibited by anglers has evolved into tournament fishing events. Insert the impetus of large dollar value prizes and you find an ever increasing demand for fishing contests. A need for regulation was perceived as a protection against over-harvest of target species during intense, short-term, site-specific events. Major contests are required to obtain a permit and report activities on an incidence basis. Data collected from this reporting system is displayed in the following table.

Fish Tournament Activity for 1983

<u>Permits Issued</u>	<u>Open Water</u>	<u>Ice Cover</u>	<u>No. of Contestants</u>	<u>No. of Lakes</u>	<u>No. of Fish Registered</u>	<u>No. of Fish Released</u>	<u>Value of Prizes</u>
81	74	7	19,768	128	12,802	4,403	\$486,289

Fisheries Research

The main goal of the Fisheries Research Unit is to provide fisheries managers with better information to more effectively manage the fishery resources in Minnesota. To accomplish this goal, every two years all Fisheries personnel are asked for input regarding the areas of fish management or culture that need further work to aid them in better managing the resource. These topics are then prioritized and as time, manpower and money become available these projects are initiated. All work in the Unit is directly applicable to the management of the fishery resource and is documented for reimbursement from the Dingell-Johnson Federal Aid Fund.

There were 13 research projects continued through the Biennium. These were:

- * Shoreline seining for 0-age bass as a method for predicting year-class abundance (112)
- * Sport fishery of Lake Winnibigoshish and connected waters (115)

- * Effects of continuous fishing on the walleye and sauger population in Pool 4, Mississippi River (116)
- * Feeding interactions of northern pike and walleye (118)
- * Evaluation of stocked flathead catfish as a predator in Minnesota lakes (121)
- * Interaction of lake trout and rainbow smelt in two northeastern Minnesota lakes (201)
- * Development of lake trout stocking procedures (203)
- * Field evaluation of hatchery reared trout (210)
- * Evaluation of chinook salmon in the Minnesota sport fishery of Lake Superior (213)
- * Cisco as an alternate prey for avian predators in rainbow trout lakes (214)
- * Evaluation of fall stocked rainbow trout fingerlings in southeastern Minnesota streams (218)
- * Evaluation of trout stream habitat management in southeastern Minnesota (219)
- * Evaluation of various strains of lake trout in inland lakes in northeastern Minnesota (220)
- * Evaluation of lake aeration techniques for winterkill prevention (305)
- * Creel census on the St. Louis River.

During the Biennium, the Research Unit initiated nine new projects.

These were:

- * Evaluation of Lake of the Woods walleye fishery (124)
- * Bluegill and associated fish community responses to yellow-perch and walleye population manipulation (125)
- * Muskellunge strain evaluation (126)
- * Walleye stocking evaluation (128)
- * Evaluation of stocked flathead catfish fingerlings (129)
- * Evaluation of lake survey sampling nets (130)
- * Evaluation of special regulations for trout in Minnesota (221)
- * Cohort densities and habitat utilization of juvenile salmonids (222)
- * Evaluation of fluorescent pigment marking (306).

Three completion reports were published in the Investigational Report series. These were:

- * Management of ponds for bait-leeches in Minnesota. (375)
- * Factors affecting brown trout reproduction in southeastern Minnesota streams (376)
- * Identification of principal spawning areas and seasonal distribution and movement of muskellunge (377).

One fish management study and one research completion report were published in the Fish Management Report series. These were:

- * A qualitative and quantitative roving creel census with a modification of the Weithman-Anderson methodology (25)
- * Angler census of the North Shore spring stream fishery 1981-82 (26).

Five reports were published in the Special Publication series after extensive editing. These included:

- * Aeration and mixing systems in Minnesota lakes (133)
- * Biological survey of the Red Lake River (134)
- * A fish management guide for northern prairie farm ponds (135)
- * Water quality monitoring in representative fish lakes 1979 and 1980 (136)
- * Biological survey of the Otter Tail River (137).

An intensive acid rain monitoring program continued through the Biennium. A completion report detailing the sensitivity of Minnesota lakes to acid rain will be published in the Special Publication Series in the next Biennium.

The Big Redd portable incubator, developed by biologist Don Olson, an advancement in egg incubation in a recirculating system. This system will give the Section of Fisheries more latitude in where to incubate eggs, as it is not dependent on large water supplies, as fixed facilities are.

In addition to the above, extensive effort and time were devoted by members of the research unit in writing and assisting in the preparation of the Minnesota-Ontario Boundary Waters Fisheries Atlas for Lake of the Woods, Rainy Lake and Rainy River. When completed, this report will provide a common data base for management of the boundary waters.

Approximately 20 percent of the research unit's time was spent in direct assistance to management. This assistance included design, implementation and analysis of creel surveys, and sample design and analysis for management projects.

At present, there are approximately 400 individuals and institutions on the mailing list for copies of our various report series. This is in addition

to internal distribution. Several papers were presented at national and international scientific meetings by personnel of the research unit, from information developed during their research projects. Several scientific papers have been published in peer-reviewed journals.

Cooperation between Research Unit personnel and University of Minnesota personnel has been increasing and is proving advantageous in providing more effective research on the management of our resource.

* * *

WILDLIFE MANAGEMENT

Wildlife management involves numerous programs and activities to preserve, maintain and enhance wildlife and wildlife habitat on public and private lands for public recreation and enjoyment.

Minnesota has nearly 12 million acres of public land, including 5.4 million acres managed by the state. Of this amount, the Section of Wildlife manages 855,000 acres in more than 975 Wildlife Management Areas (WMAs) statewide. Most of these lands are available for public use and recreation.

Management of the wildlife resources is the responsibility of the Section of Wildlife, which operates through six regions and 35 field management stations. In addition, three research facilities for wetland, farmland and forest research are located in Minnesota. These field stations are directed by the staff in St. Paul.

The state's Wildlife Management programs are: Wildlife Land Acquisition; General Management and Operations; Nongame; Natural Heritage; Scientific and Natural Areas; Establishing Hunting and Trapping Regulations; and Wildlife Research.

Summaries of programs and accomplishments during the Biennium by the Section of Wildlife follow.

Wildlife Land Acquisition

The purposes of the wildlife land acquisition program are to protect and enhance valuable habitat for wildlife and to provide areas for public hunting, trapping, and other compatible recreational activities. Acquired lands are established as State Wildlife Management Areas. Since the initiation of the program in 1951, about 524,000 acres have been acquired in 975 WMAs across the state. An additional 331,000 acres are managed through cooperative agreements with the counties, state, or the federal government.

During FY 83 and FY 84, the Section of Wildlife purchased 8,122 acres of wildlife lands at a cost of \$3.3 million. Wildlife lands were acquired in 40 WMAs in 35 counties. A major portion of the funds -- \$2.1 million for acquisition -- was derived from a general revenue bonding program entitled Resource 2000. The additional \$1.2 million was from the small-game license surcharge.

A total of 367 acres was received as gifts during FY 83 and FY 84 for use as wildlife areas.

General Management and Operations

Wetland Wildlife

To maintain managed wetlands in one-to-one ratio of water to vegetation, water level management techniques were employed on wildlife area wetlands and designated waterfowl lakes -- 74,032 acres in 1983 and 67,200 acres in 1984.

A total of 1,508 small wetlands were constructed during 1983 and 1984. These wetlands were created by constructing dugouts, digging level ditches and

canals, and by reclaiming small drained wetlands. The total number of artificial nesting structures that were installed and maintained reached 1,435 in 1983 and 1,631 in 1984.

Farmland Wildlife

Providing winter cover, nesting cover and winter food supplies are important programs in farmland areas. During the Biennium, the following farmland wildlife projects were undertaken on Wildlife Management Areas:

	<u>1983</u>	<u>1984</u>
Number of New Woody Cover Plantings	37	65
Number of Wildlife Food Plots	984	1,156
Acres of Development and Improvement of Nesting Cover	7,382	13,206

Forest Wildlife

During 1983, Deer Habitat Improvement Program expenditures accomplished the following: 407,207 acres of habitat evaluated; 10,774 acres of browse regenerated; 2,336 acres of wildlife openings created or maintained; 30 miles of trails constructed or maintained.

In 1984, an extra dollar from the deer license was available for the program. Accomplishments were: 795,614 acres of habitat evaluated; 17,597 acres of browse regenerated; 2,405 acres of wildlife openings created or maintained; 53 miles of trails constructed or maintained.

Management

Besides the management of terrestrial and aquatic habitats, much effort is required to protect WMAs and to provide public facilities for the users of these wildlife lands. The following development and maintenance practices were undertaken:

	<u>1981</u>	<u>1982</u>
Boundary Marking (miles)	718	1,152
Public Use Facilities (number)	683	643
Noxious Weed Control (acres)	9,848	10,364

Boundary marking includes the signing of wildlife areas and fencing as needed to mark and protect these lands. Public use facilities include parking lots and access and logging roads and trails, as well as hunter shooting blinds. Noxious vegetation control on state lands where the primary weeds controlled are thistles is required by state law.

Wildlife Development

State Migratory Waterfowl Stamp

During each year of the Biennium, \$440,000 for wetland development projects was appropriated by the Legislature from the sale of the \$3.00

waterfowl stamp. Projects constructed were primarily on state-owned WMAs and lakes designated for wildlife management purposes.

Newly constructed wetlands completed during FY 83 and FY 84 were as follows:

Bossuyt WMA, Lincoln County - 42 acres
 Sween WMA, Chippewa County - 60 acres
 Ruf-Nik WMA, Todd County - 18 acres
 Loerch WMA, Crow Wing County - 100 acres
 Seha WMA, LeSueur County - 123 acres

Other projects included the repair of outlet dams and dikes and replacement of water level control structures on 18 wetlands totaling 13,841 acres. Of this amount, major upgrading of dikes and replacement of water control structures was started on Pools 1 and 2 of the Roseau River WMA. An additional mechanical vegetation cutter was purchased for improving wetland habitat.

Betterment of Wildlife Management Areas

During FY 84-85, a total of \$400,000 was made available for improvement of WMAs. The sale of state 20-year bonds (Resource 2000 funds) was approved by the Legislature and monitored by the Legislative Commission on Minnesota Resources (LCMR). The primary program emphasis is to develop and improve lands that have been purchased.

Efforts have centered around the development and improvement of public facilities such as parking lots, accesses and walking trails. Funds were used to develop nesting cover to domestic or native prairie plants, establish cover plantings and to construct firebreaks to improve land management.

Other Key Wildlife Programs

Private Land Wildlife Habitat Improvement

Cost-sharing to develop wildlife habitat on private land has proven effective. The following private land projects were completed under the Wildlife Habitat Improvement Program, funded by revenues from pheasant stamp sales, game and fish fund and deer habitat improvement fund.

	<u>FY 83</u>		<u>FY 84</u>	
	<u>No.</u>	<u>Acres</u>	<u>No.</u>	<u>Acres</u>
Nesting Cover	2	13	128	1,280
Food Plots	448	1,345	997	2,443
Wetland Development	14	85.5	4	140
Woody Cover (rows)	20	264	142	1,846
Cost:		\$194,000		\$576,000

State Pheasant Stamp

FY 84 was the first year of the expanded pheasant habitat improvement project funded by proceeds from pheasant stamp sales. The project involves six priority endeavors, all which received attention during FY 84.

The pheasant winter feeding emergency of FY 83 and FY 84 required the coordination of corn distribution and feeding with thousands of volunteers involved. Ultimately about 5 million pounds of corn were bagged, shipped and deposited for pheasant feed, although deer benefitted as well.

A new Roadside Coordinator was hired and is charged with the responsibility of improving pheasant nesting conditions on 76,000 miles of Federal, State, County and township roadways encompassing 525,000 acres of nesting cover. For the immediate future, efforts will be directed toward increasing public awareness concerning the value of roadsides to wildlife.

Wildlife Management Area Inventories

The Wildlife Management Area (WMA) Inventory was initiated in June 1980 by the Section of Wildlife and was funded through July 1983 by the Legislative Commission on Minnesota Resources. Its purpose was to quantify and map the physical, biological and cultural features of Minnesota's small WMAs. Maps and computer summaries were produced for 950 WMAs covering more than 350,000 acres. County, region, and statewide summaries were produced. In FY 84 the eight major units with resident managers were added to the inventory data base.

The WMA inventory showed that 48 percent of the total acreage in the wildlife areas was classified as wetland. More than 3,180 basins were identified, of which 80 percent are type 3, 4, or 5 wetlands. Active cropland accounts for 3.4 percent of the total acreage, while grasslands make up 9 percent. Of the grassland total, 12,500 acres are natural prairie. Deciduous forest cover types are 25.6 percent of the total, with more than half being aspen.

Nongame Wildlife Program

The Nongame Wildlife Program continued to grow during the past Biennium, and citizen support for this project has also continued to increase. Nongame Wildlife Checkoff income for tax year 1983 hit a new record: more than \$640,000 from approximately 200,000 taxpayers.

Donations received are being used for more than 90 wildlife conservation projects to preserve the diversity and abundance of Minnesota nongame wildlife resources.

A comprehensive plan for the management of Minnesota nongame wildlife will be completed by June 30, 1985.

Research and inventory projects under way in 1984 have included work on bald eagles, bats, burrowing owls, wood turtles, herons, sandhill cranes, bluebirds, frogs, five-lined skinks, common terns, darters, herring gulls, turkey vultures, Franklin's gulls, chestnut collared longspur, shovelnose sturgeon, snowy owls, and hummingbirds.

Restoration projects under way include those for trumpeter swans and peregrine falcons.

Habitat management activities and a variety of information and education efforts are being carried out by five regional nongame specialists (in St. Paul, Bemidji, Brainerd, Grand Rapids, and New Ulm).

Information and education development has included production of audio-visual slides on bluebirds, snakes, and backyard wildlife; posters on winter birds and springtime wildlife; and a booklet entitled "Woodworking for Wildlife."

Minnesota's Nongame Wildlife Program also includes activities relating to data management; endangered species listing and management; environmental services; and land acquisition and technical services. The program is now being used by many other states as a model for the development of their respective nongame wildlife programs. Minnesota established a nongame check-off in 1980, the third state to do so. There are now 33 states with wildlife checkoffs.

Natural Heritage Program

The Minnesota Natural Heritage Program (NHP) promotes the understanding and wise stewardship of Minnesota's natural ecosystems. The NHP conducts field inventories and research on the numbers, condition, and distribution of rare plants, ecologically sensitive plant communities and other natural features now uncommon on the landscape. This biological data is integrated into the state's resource planning process and also made available to private consultants, planners and other decision makers to further conservation efforts and minimize adverse impact on the environment.

NHP staff botanists currently provide botanical assistance to the Department's Scientific and Natural Area staff, nongame specialists, wildlife managers and researchers, foresters, and park naturalists. NHP staff has continued the development of the Minnesota Natural Heritage Register of public lands. Nineteen sites have been registered.

In addition the program coordinated the Endangered Species Technical Advisory Committee and in January 1984 produced Minnesota's first endangered species list. The results of this work are now in the process of being published in a two-volume book by the University of Minnesota Press.

Scientific and Natural Areas Program

The Scientific and Natural Areas (SNA) Program, through the establishment of SNAs, protects and perpetuates the natural diversity of the state, including rare and endangered species, plant communities, geologic features and unique land forms.

Nine new Scientific and Natural Area units were designated during FY 83 and FY 84, three of which were received via a transfer from the federal government. In addition, integral parts of two units were received as donations from private landowners, while critical inholdings in two units were exchanged for other public lands. Three units were acquired during the Biennium, at a cost of \$280,000, under Resource 2000. These units are Pine and Curry Island SNA, protecting the Midwest's largest breeding population of piping plover, a state endangered shorebird; Black Dog Preserve SNA, protecting habitat for seven rare plants and a calcareous fen, one of the rarest

plant communities in North America; and Crookston Prairie SNA, virgin prairie in northwest Minnesota containing several rare plants, a calcareous fen and rare prairie bird species.

Three other SNAs protecting a large assemblage of orchids, a unique lake resource, and the world's largest concentration of prairie bush clover were designated on lands already in public ownership. The addition of these nine units brings the state SNA system to a total of 34 units protecting approximately 11 percent of the state's rarest resources.

Hunting Season

Deer

The registered deer harvest for the 1982 and 1983 hunting seasons was as follows:

	<u>1982</u>		<u>1983</u>	
	<u>License Sale</u>	<u>Registered Harvest</u>	<u>License Sale</u>	<u>Registered Harvest</u>
Deer Firearms	372,128	93,045	394,710	132,457
Archery	55,010	5,566	56,300	5,977
Muzzleloader	2,325	441	2,400	652

Moose

The seventh moose hunt was held in the fall of 1983. In northwestern Minnesota there were 16 zones, with 776 permits issued to parties of four hunters. A total of 737 moose were taken in the northwest. Twenty zones were established in the northeast. The harvest was 442 moose from 520 permits.

Turkey

Minnesota has had spring turkey hunting seasons since 1978. A limited number of permits are issued through a computerized drawing. The harvest (1981-1984) follows:

	<u>Harvest</u>	<u>Permits</u>
1984	178	3,000
1983	116	2,100
1982	106	2,000
1981	113	1,500

Waterfowl and Upland Game

	<u>1982</u>	<u>1983</u>
Ducks	1,071,000	1,235,000
Geese	81,000	62,000
Pheasants	265,000	299,000
Ruffed Grouse	302,000	183,000
Sharp-tailed Grouse	17,000	10,000
Hungarian Partridge	52,000	74,000
Squirrels	433,000	325,000
Rabbits, Hares	168,000	111,000
Raccoon	80,000	87,000
Fox (Red and Gray)	21,000	23,000

Trapping

	<u>1982</u>	<u>1983</u>
Muskrat	570,000	865,000
Mink	57,000	58,000
Beaver	34,000	106,000
Raccoon	60,000	69,000
Fox (Red and Gray)	46,000	47,000

License Sales

	<u>1982</u>	<u>1983</u>
Small Game Licenses	314,977	276,034
Trapping	20,196	16,741
Migratory Waterfowl Stamp	125,975	126,925

Forest Wildlife Populations and Research Group

The Forest Wildlife Populations and Research Group deals with a wide variety of wildlife species, ranging from sharp-tailed grouse to moose, in the northern forested area of the state. The group provides the design, coordination and analysis of the many surveys required to monitor and manage these populations; extends laboratory services for research, management and enforcement; and conducts original research in areas of immediate concern to the management of these resources.

For many populations (such as ruffed grouse, beaver, coyote, etc.), the surveys are designed to monitor population trends over broad geographical areas. For more sensitive species, or those for which harvest quotas are established (such as deer, moose, bear, otter and bobcats), more detailed population data is required for proper management and is obtained from many different surveys and population models.

Laboratory services are provided as support to wildlife projects and enforcement; these services are provided to cooperators or are contracted to other agencies. During the Biennium, ages of more than 10,000 deer, moose, bear and furbearers were determined, in conjunction with population management

functions. A large number of blood and biological materials were analyzed in support of research on wildlife nutrition and physiology. New techniques were developed, in conjunction with the Wetlands Wildlife Research Group, to assay duck blood to measure exposure of birds to lead poisoning.

In forensics, as a service to the Division of Enforcement, evidence was processed from more than 60 cases -- the identification of meat, hair, feathers, blood stains, etc. -- for use in prosecuting game law violators. A major research project on the coyote has been completed, data analyzed and the results compiled as a Wildlife Monograph, to be published by the Wildlife Society. More than 3,200 carcasses of furbearers (otter, fisher, bobcat, lynx) have been examined to determine productivity, food habits, age and sex structure of the harvest and parasites and diseases for use in understanding these sensitive populations, and in population modeling as a management tool. Preliminary work has been started on studies of river otter, bobcats and fisher but these studies require additional funding.

Major research has continued on population ecology of the black bear; 81 bear have been fitted with radio collars and monitored periodically to determine survival and fatality, population densities and movements and factors affecting the population. Work is continuing on the development of suitable bear population census techniques, including a bait-post survey, analysis of age and sex structure of the harvest and others. Much of the information generated by the bear research is being incorporated into the bear management program.

Through the Deer-Wolf Project, funded under Section 6 of the Federal Endangered Species Act, deer and timber wolves have been radio-collared and their movements and mortality monitored on the Bearville Study Area of north-eastern Itasca County. The project is designed to establish the sources and extent of deer mortality on an area with wolves and deer hunting. A new method for accurately determining deer and wolf survival rates has been developed from this study.

A new method for conducting the aerial census of moose was initiated and carried out during this Biennium. Censusing of animals is always a problem and moose are no exception. The Division's aerial census techniques, as now applied, are based on 25 years of experience in Minnesota and in moose range elsewhere across the continent. The result is a survey that overcomes many of the problems of this process and one that provides a more reliable estimate of the moose population on the three major moose ranges in the state.

Computers and word processors are serving ever-greater roles as management, research and communications tools. The Forest Wildlife Populations and Research Group was the first DNR unit to have microcomputers, and the addition of new units with the support of an EDP Programmer, will greatly expand work capability.

The Forest Wildlife Populations and Research Group has maintained a high level of input into the management of forest wildlife species in Minnesota and continues as a leader in the field. Many formal and informal reports were prepared, submitted and accepted. Group members hold responsible positions in local, state, national and international groups, contributing to the field of wildlife management.

Wetland Wildlife Population and Research

For many years, Minnesota has put considerable effort into waterfowl banding. Banding is done in three segments: summer banding of "local" flightless young ducks; pre-season (mid-September) banding of flying young and adult ducks; and Canada goose banding. Banding and recovery data are used for estimating various population parameters of waterfowl. Of great significance to waterfowl management has been the use, in recent years, of banding data in assessing the effects of hunting on population survival.

Each May, aerial and ground transects are run to estimate the number of breeding waterfowl in the state. Minnesota's first large-scale systematic aerial waterfowl survey was made in 1951. These were flown intermittently until 1967 and each year under standardized conditions since then. Results of these counts form a valuable data base on changes in abundance of various waterfowl species nesting in the state.

Aerial fall migration surveys (September through mid-November) are also conducted. The results are distributed throughout the state and provide insight into the waterfowl migration pattern each fall.

Five major research projects are being conducted. Results will be analyzed and prepared for publication. The projects are:

1. Evaluation of stabilized hunting regulations for waterfowl (in cooperation with the U.S. Fish and Wildlife Service).
2. The ecology and management of the ringnecked duck in northern Minnesota.
3. Brief population trends of cavity-nesting waterfowl in Minnesota.
4. Migration ecology of lesser scaup in Minnesota.
5. Importance of our water habitats for nesting mallards in west-central Minnesota.

Results of each of these projects will provide new information concerning waterfowl ecology and management and further sound, scientific waterfowl management in Minnesota and the nation.

Farmland Wildlife Populations and Research

As with all research groups, the Farmland Wildlife Group is substantially involved in monitoring population levels of various species. In fact, August 1985 will mark 30 years of standardized roadside wildlife counts. These counts continue to provide very dependable population trend data for many of the game species in the farmland zone (pheasants, rabbits, gray partridge, to name only a few). Other annual surveys determine the reproductive success of white-tailed deer; the number and location of car-killed deer (both are critical in developing deer population models needed in the allocation of antlerless permits); and the spread and relative size of Minnesota's wild turkey population. This information is valuable in the season-setting process and in keeping managerial personnel and the public abreast of wildlife population changes.

A survey of Area Wildlife managers indicated a need for more population and management information on gray partridge. The interaction of pheasant and gray partridge populations, chick food habits and habitat preferences, and winter habitat use are the present concerns. Hunting and recreational

opportunities provided by this challenging upland game bird and methods of management will also be examined.

The wild turkey population in the Whitewater WMA has recently experienced rather drastic declines. With financial help from both the national and state wild turkey federations, an in-depth telemetry project is being conducted to determine the principal causes for the decline.

Farmland deer research, an important function of the staff, has included studies on the effects of fences on car kills, frequency of bovine diseases in deer populations, fawn mortality rates, effects of refuges on deer survival and movements and aerial deer-count effectiveness. The results of these projects are published or are in the process of being published. The research staff is now conducting an inventory of the present and potential wintering areas in the Minnesota farmland zone. The frequency, location and magnitude of deer depredation will be documented, summarized and analyzed. Aspects of both of these studies will be used in providing information critical to the management of deer in Minnesota's farmlands.

The projects on the effects of trapping season on the depressed muskrat population and the value of 10-row shelterbelts to nesting wildlife have been concluded and reports will be written. A study designed to measure the effects of 10-row shelterbelts on the distribution and survival of pheasant populations will be undertaken shortly. This latter study should provide data valuable to the management program funded by the pheasant stamp.

* * *

ECOLOGICAL SERVICES

The Ecological Services Section, Division of Fish and Wildlife, provides technical support and biological and chemical laboratory services directly to DNR management, research, enforcement and planning personnel in the field and central office; and both directly and indirectly to several million anglers, hunters, trappers, lake property owners, resorters and others in the private sector who enjoy or benefit from the state's natural resources.

The section is organized into five working units: (1) Biology Laboratory; (2) Chemistry Laboratory; (3) Monitoring and Control Unit -- aquatic nuisance control, pollution investigations, power plant monitoring, lake aeration; (4) Surveys and Review Unit -- ecological investigations, river surveys, environmental review; and (5) Special Projects Unit -- lake sounding and mapping, data processing and analysis, graphic services, in-stream flow analysis, and special investigations.

Surveys and Review Unit

The following surveys, studies and investigations were accomplished during FY 83 and FY 84 by the Surveys and Review Unit:

Fish and wildlife habitat evaluation studies were conducted or continued on 16 major and 13 minor proposed development projects of the U.S. Corps of Engineers, Minnesota Department of Transportation, U.S. Soil Conservation Service and local governments and private firms.

Reviews, comments and recommendations were made on 285 environmental documents of other agencies.

Fish and wildlife surveys were conducted on 239 miles of major rivers: Red River, 102 miles; Minnesota River, 115 miles; Kettle River, 13 miles; and Fishhook River, 9 miles. Investigational reports for the Otter Tail and Red Lake River surveys were completed and a report is in progress for the Minnesota River.

Reviews of the 394 U.S. Corps of Engineers permit applications received were completed and coordinated with DNR area fish and wildlife managers for their information and involvement.

Fish collections were made on the Mississippi, Minnesota, St. Croix, Kettle, and Fishhook rivers to provide specimens for pesticides, PCB and heavy metal analysis by the Minnesota Pollution Control Agency and the Metropolitan Waste Control Commission.

Monitoring and Control Unit

The following activities were carried out by the Monitoring and Control Unit:

A total of 1,216 aquatic nuisance control permits were issued during the Biennium by the Section of Fisheries field staff. The Ecological Services Section coordinates this activity on a statewide basis through permit review; technical advice on aquatic herbicides and control methods; testing, licensing

and certification of aquatic applicators; gathering of information for an annual report on the aquatic nuisance control program; and enforcement of current state and federal laws on aquatic herbicide use.

Aquatic pesticide regulations were enforced through a grant program from the U.S. Environmental Protection Agency. A total of 260 aquatic herbicide treatment areas in public waters were inspected to insure compliance with applicable federal and state regulations.

A total of 216 pollutive spills were reported to the section. Eighty-four of these required investigation; 34 included fish and wildlife kills. Sixty-two cases of fish or wildlife kills resulting from natural causes were investigated or coordinated with Division field staff. Investigations of pollution-caused kills resulted in \$59,252 in settlements and payments by offending parties to the Game and Fish Fund. The Attorney General's Office supported the unit in seeking legal settlements.

Twenty-five proposed waste discharge permits of the Minnesota Pollution Control Agency were reviewed for possible conflict with fish and wildlife management interests.

Approximately 400 fish specimens needed for chemical analysis by various involved state and federal agencies were collected.

During the Biennium, 177 permits were issued or reviewed for installation and operation of lake aeration systems, primarily for prevention of winterkill of fish. In the winter of 1983-84, a total of 200 on-site inspections were made of the aeration systems authorized by these permits.

Review of 112 proposed Division of Forestry forest spraying projects was carried out to protect fish and wildlife interests and prevent pollution of surface water.

Special Projects Unit

The following activities were carried out by the Special Project Unit:

A total of 81 lakes (comprising 16,930 acres) were sounded; 97 lake maps completed; and 23 lake maps were contoured but not completed. The finished maps were given to the Department of Administration's State Register and Documents Division for duplication and sale to the public.

Fifty-seven benthos (bottom fauna) samples were collected or processed from the Minnesota, Otter Tail, Sunrise, Clearwater, Fishhook, and Cannon rivers, and the results summarized for inclusion in reports. The data is used to characterize the kinds, numbers and volume of bottom fauna organisms present, and to indicate the suitability of the aquatic habitat for fisheries and recreational use.

The section's computer terminal was utilized for input, analysis and retrieval of lake and stream survey data for a variety of purposes, including the writing of river survey reports and completion of stream use attainability surveys for the Minnesota Pollution Control Agency.

One staff member was assigned to represent the Fish and Wildlife Division in working with the U.S. Army Corps of Engineers, DNR's Division of Waters, and the U.S. Fish and Wildlife Service in determining protected low flows for fisheries, wildlife and recreational needs in the Mississippi, Minnesota and other state rivers. Thirty in-stream flow investigations of the fish and wildlife aspects of hydropower and water appropriation projects were worked out.

One staff member was assigned to provide data to the DNR Division of Forestry for inclusion in the Minnesota Forest Resources Plan, and to review and comment on aspects of the plan related to fisheries.

More than 500 requests from other agencies and the public, for lake and stream survey and mapping data, were answered.

Graphic services were provided to the Division of Fish and Wildlife as requested, with approximately 80 projects completed in the form of special charts, graphs, figures and drawings required for publication and displays.

Laboratory Services

Laboratory work carried out during the Biennium included the following:

- * A total of 8,143 various examinations and tests (including autopsies) were performed on 5,129 fish and wildlife specimens.
- * A total of 198 technical memoranda and reports were prepared covering results of laboratory tests, investigations, and prescriptions.
- * Assisted personnel of the DNR Division of Enforcement in the investigation and analysis of forensic evidence in the prosecution of game and fish violation cases. The laboratory supervisor on several occasions provided testimony in court. A total of 391 articles of evidence were examined.
- * Coordinated fish health monitoring practices at all State Fish Hatcheries and supervised fish health clearance requirements for 90 Minnesota DNR Game Fish Transportation and Importation permits.
- * Lab Supervisor served as Chairman of Fisheries Forensic Science Task Force of Great Lakes Fish Disease Control Commission Workshops, and contributed to Special Publication Number 83-2, a guide to integrated fish health management.
- * Studied and collaborated with others in studying fish diseases and anomalies: lymphosarcoma in northern pike, myofibrogranuloma in walleye, cyanocobalamin B12 metabolism in rainbow trout and encephalocoele lesions in brown trout.
- * Served as liaison for DNR with the Minnesota Department of Health, Veterinary Diagnostic Laboratories, and Minnesota Board of Animal Health to coordinate efforts in preventing the transmission of diseases in animal populations.

Chemistry Laboratory

A total of 2,813 samples and specimens were received by the laboratory during the Biennium and some 9,052 tests performed. Examples of work performed include the following:

- * Analysis of water samples collected during lake and stream surveys, pollution investigations and fish hatchery effluent monitoring.
- * Analysis of water samples from streams and lakes for residues of herbicides used for conifer release and site preparation by the DNR Division of Forestry.
- * Analysis of wildlife specimens for various toxins including strychnine, Avitrol, ethyl alcohol, Warfarin, and sodium fluoroacetate.
- * Determination of nutritional value of aspen browse samples for grouse food as part of a research study by the DNR Section of Wildlife and University of Minnesota.
- * Forensic work on deer-kill specimens as an aid to prosecution of game law violators.
- * Protein analysis of deer browse samples, in support of the DNR Big Game Research Program.
- * Lead analysis of goose livers for the DNR Nongame Wildlife Program to determine if bald eagles were receiving secondary poisoning by eating geese killed by ingesting lead shot.
- * Lead analysis of eagle blood to determine mortality factors.
- * Cholinesterase inhibition screening tests to diagnose causes of fish and wildlife kills.
- * Analysis of game farm food (used in pheasant rearing) for trace metals.
- * Light hydrocarbon analysis of well-water samples collected over the underground natural gas storage area in southern Minnesota.
- * Analysis of rotenone content of fish toxicant formulations used by the Section of Fisheries to reclaim lakes.
- * Analysis of lead residues in soil and water from a toxic waste site.
- * Determination of chlorocarbon residues in duck eggs, in support of a study by the Division's Waterfowl Research Unit.
- * Study of endrin residues in ducks to determine if flesh is safe for human consumption.
- * Analysis of PCBs and other chlorocarbon residues in fish flesh to determine potential effect on fish health and fish edibility (in cooperation with the Minnesota Department of Health and the Minnesota Pollution Control Agency).

* Numerous special and one-time-only analyses for support services to Division of Fish and Wildlife Sections and other DNR units.

Advice and technical assistance extended to Division of Fish and Wildlife Department personnel on numerous questions and issues related to chemistry, limnology and animal nutrition.

* * *

FOREST RESOURCE MANAGEMENT

Approximately one-third (16.7 million acres) of the state's total land area is forested and supports the third largest manufacturing industry in the state -- the forest products industry. More than 50,000 people are directly employed by Minnesota's forest products industry. Primary and secondary manufacturing contributes \$2 billion per year to the state's economy. Studies indicate that for each \$1 of government expenditures in forestry, \$1.83 is generated in economic activity, 50 percent of which ends up as personal income in local households. Each \$1 in timber stumpage generates an estimated \$26.84 in product value after milling. Further increases in economic impact can be expected when newly established wood product plants producing such materials as waferboard and oriented strand-board reach full production.

The state's forests also play a major role in supporting Minnesota's significant tourism industry by providing good wildlife habitat, quality forest recreation opportunities, and an aesthetically pleasing environment.

The goal of the Division of Forestry is to protect and manage the state's forest resources to maintain the social and economic benefits derived from these resources for the benefit of present and future generations. The major functions of the Division to carry out this goal include: 1) multiple use management of 4.6 million acres of state forest and other state-owned land; 2) forest fire protection on 22.8 million acres; 3) forest and shade-tree management assistance to non-industrial private forest landowners, counties, schools and municipalities; 4) management evaluation and planning for 13.7 million acres of commercial forest lands; 5) assistance to wood users to improve harvesting, utilization and marketing of the timber resource; 6) insect and disease protection on 16 million acres of forest land; and 7) production of tree planting stock at state nurseries.

The following summaries of each of the Division's programs include a brief description of the program, a list of accomplishments, identification of natural resource management issues relating to the program area, and future directions for the program.

Fire Management

The Division of Forestry provides protection from forest and grass fires on 22.8 million acres of public and private land. This protection includes prevention, presuppression and suppression activities necessary to avoid the loss of life and property and natural resource values.

Prevention activities such as public education, law enforcement and burning regulations inform the public of the dangers of uncontrolled open fires, improper machine use, incendiarism and carelessness. Presuppression activities are conducted to prepare suppression forces for the eventuality of a fire and for locating fires. These activities include training crews, developing cooperative agreements for crews and equipment, maintaining equipment at a state of readiness, and developing dispatching plans. Suppression activities are aimed at controlling fires at the minimum possible size and extinguishing them in the shortest time possible.

During the past two fiscal years, a total of 2,478 fires burned 82,577 acres. In comparison, the FY 1981-82 total was 2,570 fires and 91,000 acres. The major causes of fires over the past two years, by percentage, were: railroad, 5 percent; children, 7 percent; equipment use, 5 percent; escaped fires caused by burning debris, 32 percent; and arson, 38 percent.

Arson, responsible for more than half the acres burned, has been a problem for several years. Enforcement of the statutes designed to prevent forest fires have been, and will continue to be, strengthened to help reduce arson. The Department has increased training of both forestry personnel and conservation officers in techniques and methods of apprehending those responsible for fires or in violation of forest fire statutes. In addition, arson investigation teams of forestry personnel and conservation officers have been established and trained for detailed fire cause investigation. Over a period of time these activities should reduce the number of fires and the state funds expended for fire control.

For a number of years the Division of Forestry, along with federal agencies both within and outside of Minnesota that have forest fire control responsibilities, conducted fire control activities under the "Large Fire Organization" system. This system had two major drawbacks: 1) it was not designed to deal with local sharing of forces, such as between the U.S. Forest Service and the State of Minnesota; and 2) it was foreign to fire departments, which increased training and limited mutual aid efforts. These have been corrected by a new system called the "National Interagency Incident Management System" (NIIMS). The Division is in the process of converting to NIIMS, as are the federal agencies concerned with fire protection. The personnel time involved in the change-over will be considerable. However the benefits gained through increased cooperation and sharing of fire resources will far exceed the cost and will provide a higher level of fire protection in the state.

The Legislative Commission on Minnesota Resources (LCMR) provided funding for the following projects to enable the Division to provide a higher level of fire protection:

- * A new computer reporting system that is near completion will improve the collection of daily fire occurrence and status information throughout the state. This will increase the Division's effectiveness and efficiency in dispatching fire resources and applying prevention measures.
- * The Fire Management Analysis Project, completed in FY 83, has improved the Division's ability to supply fire protection to the state.
- * An evaluation of the economic efficiency of the fire program was started in FY 84. The purpose of this study is to recommend a safe, efficient, and economically justifiable level of forest fire protection for the state. When complete, this information, along with fire planning information, will be used in developing the Division's administrative area unit plans and a statewide fire plan. In addition, a joint economic analysis will be done with the U.S. Forest Service.

The use of large, privately contracted aircraft capable of dropping fire retardant is a part of the cooperative suppression resources of Minnesota, the U.S. Forest Service and the Bureau of Indian Affairs. Development problems

exist at two of the Minnesota-administered bases used to operate these air tankers. The Hibbing Tanker Base construction was not totally completed due to lack of funds. The tanks used to store water and retardant are not mounted properly, presenting a safety concern; and the aircraft loading system was not completed, which can delay fire dispatches. The Brainerd Tanker Base must be relocated from the presently leased area due to airport construction and the resultant congestion which presents a safety problem. Funds to correct both these situations will be included in Departmental budget requests.

The Division administers two federal programs designed to improve rural fire departments' structural fire protection capabilities to aid the Division in its forest fire control responsibilities.

The Rural Community Fire Protection Program provides financial, technical, and other assistance to rural communities and aids their fire departments in developing and improving their wildland and structural fire suppression capabilities. Financial assistance is in the form of a matching grant which requires the local communities to provide 50 percent of the project cost. During this report period, more than 800 applications were screened for funding. A total of \$225,000 for purchase of equipment and training was assigned to approximately 250 fire departments. The Division must maintain an inventory of those items purchased with matching funds that are individually valued at \$300 or more. At present this inventory covers more than 1,400 items that have been placed with over 460 different fire departments.

Equipment received through the Federal Excess Property Program may be used for internal fire suppression or it may be assigned to rural fire departments. During FY 83-84 the value of equipment acquired exceeded \$1,172,832. Due to the shortage of equipment funding in the Department's budget, some \$710,382 worth of this equipment was retained for internal use. The remainder was assigned to rural fire departments and approximately 400 other pieces of equipment were assigned to fire departments. Additional items included: radios, trailers, tanks, pumps, tools, and other related equipment.

As of June 30, 1984, more than 800 pieces of equipment had been placed with rural fire departments under this program. Presently there are requests for 200 motorized fire units in addition to pumps, tanks, hose, radios and other equipment. If the Department's change level requests for equipment funding are granted by the Legislature, the dependence of the state on this type of equipment will be reduced and more equipment could be provided to local fire departments.

Forest Recreation

The Division of Forestry administers and maintains 57 campgrounds with 821 campsites, 61 day-use areas with 245 picnic sites, 172 water access sites and 1,470 miles of trail serving a variety of purposes. Use statistics available for 34 campgrounds where fees are charged show an increase in camper nights from 45,000 in FY 79 to about 70,000 in FY 84. Use at other facilities has also increased but no figures are available. While use has increased at these facilities, funding levels for operation and maintenance have not increased in proportion to the amount of use or inflation. Consequently, services have been reduced, facilities and equipment that are wearing out have

not been replaced, and user complaints about the lack of service or supervision have increased.

The "Minnesota Forest Resources Plan," completed in 1983, documented the need to upgrade and rehabilitate many existing recreational facilities because of age and general deterioration. The plan also called for increased levels of funding and effort for continuing maintenance of facilities. In FY 83 recreational facilities were operated and maintained as in the past. No major projects were initiated. However, the Division hired a forest recreation specialist that year to oversee the recreation program. Increased funding for better maintenance and supervision at existing recreational facilities is still needed.

The Legislative Commission on Minnesota Resources (LCMR) provided funding for FY 84 to upgrade and rehabilitate eight existing recreational sites and to rehabilitate and develop additional sites in the Richard J. Dorer Memorial Hardwood Forest. In addition, the Legislature approved the sale of bonds to rehabilitate and upgrade four sites. The Outdoor Recreation Act of 1975 (M.S. 86A) requires a plan to be prepared before extensive rehabilitation or new development can begin. During FY 84 five plans were completed and significant progress was made on four others. Upgrading and development activity has been initiated at four sites.

As part of a continuing planning process initiated in 1984 the Division of Forestry is preparing unit plans for the Division's administrative areas. There are 19 areas in the state containing approximately 4.5 million acres of Forestry-administered land. Each unit plan will contain a recreation sub-area plan for the area's existing and contemplated recreational facilities. Recreational planning began for the Moose Lake Area in FY 84. The "Moose Lake Area Recreation Sub-Area Plan" has identified development, upgrading, rehabilitation and maintenance needs for six campgrounds, two day-use areas, a number of existing dispersed recreation facilities and approximately 225 miles of trail.

Forest Pest Management

Insects and diseases are the major cause of growth loss and mortality in Minnesota forests. The activities of pests result in loss of about one-half of the annual forest growth in the state. Wood competition in forest plantations restricts the establishment of forest stands following harvest, hampering forest management intensification efforts. The Division of Forestry is charged by state law with controlling forest pests on public and private lands within Minnesota. Past emphasis of the program has been on state land management. More emphasis is needed in nursery, urban, private and county forest pest management. In addition, concerns over the use of pesticides for forest management need to be addressed.

Information transfer activities were an important highlight within the Forest Pest Management Unit during FY 83 and FY 84. The following were among achievements by the unit, in addition to normal information and education efforts:

- * Presentation at two regional and two national technical conferences. Conferences addressed the spruce budworm, forest entomology, management

of established forest stands and black walnut management. Proceedings of these meetings are distributed nationally.

- * Coauthored the Forest Protection section of the University of Minnesota's Forest Management Correspondence Course, which was released nationally.
- * Coauthored "Gypsy Moth in Minnesota: The Early Years," a pamphlet released by the Agricultural Extension Service of Minnesota.
- * Conducted an introductory forest insect and disease training session for field foresters from the North Dakota State Forest Service.

Forest Pest Management personnel in 1983 made presentations to more than 25,000 citizens on forest pest management.

A strong increase in nursery pest management activities was evident during the Biennium. Cooperative projects were conducted with the U. S. Forest Service on control of jack pine gall rust, *Lophodermium* needlecast, *Diplodia* tip blight, and nursery weed problems. In addition, a joint evaluation of beneficial mycorrhizae organisms was conducted. These projects led to the development of control programs for addressing these serious problems within Minnesota's state forest nurseries.

The gypsy moth, a serious defoliator of hardwoods in the northeastern United States, has become established as localized infestations within Minnesota's seven-county metropolitan area. This has resulted in the treatment of 300 acres within two locations in 1983 and 90 acres within three localities during 1984. These treatments were instituted by the Minnesota Department of Agriculture and have shown excellent success. The Division has maintained active involvement in the Gypsy Moth Ad Hoc Committee, which provides support for management activities and a mechanism for information transfer among agencies involved with gypsy moth management. The forest pest unit placed 800 detection traps in 1983 and 1,000 traps in 1984 in the forests and forest recreation areas of the state. Fortunately, no moths have been collected within these areas. The unit has begun the development of a long-range plan for gypsy moth management within Minnesota.

Activity by both the spruce and jack pine budworms accelerated during the Biennium. The jack pine budworm buildup may result in heavy losses within the state during the next Biennium. The balsam fir resource, under attack by the spruce budworm, does not constitute the potential economic impact posed by the jack pine budworm. Risk rating of jack pine stands to identify the greatest potential areas of losses has been undertaken by the forest pest unit. A loss assessment project for spruce budworm was completed during the Biennium and an intensive evaluation of the impact of the jack pine budworm has been undertaken.

Vegetation management with herbicides to protect regenerating forest stands rose to approximately 8,500 acres in 1983 and 12,000 acres in 1984. This increased activity comes as a direct result of the Division's forest intensification efforts in regenerating forest lands.

The forest pest unit maintained surveillance and detection efforts on more than 16 million acres per year during the Biennium. Control programs for

forest pests were conducted on a total of more than 5,000 acres. The unit was also allocated a new pesticide specialist position by the Legislature to continue improving the quality and effectiveness of it's pesticide application programs.

A first time planting of genetically improved seedlings resistant to white pine blister rust was conducted on four state forest areas in conjunction with the U. S. Forest Services white pine tree improvement program. The areas potentially will provide an invaluable source of improved seed for regenerating white pine in Minnesota's future.

Nursery and Tree Improvement

The goal of the nursery program is to produce tree planting stock for use on public and private land for afforestation, reforestation, windbreaks and shelterbelts. In the spring of 1984 the DNR tree nurseries shipped 19.9 million tree seedlings for planting, responding to more than 4,300 individual tree orders. About 50 percent of the seedlings were planted on public lands. Private landowners and forest industries purchased the remainder of the seedlings for planting on their lands. These seedlings reforested about 25,000 acres of land. In FY 85 the nurseries expect to ship 24 million seedlings that will reforest 30,000 acres.

Activities in the tree improvement program continue to increase. The goal of the program is to produce and collect seed, from superior trees, for the production of seedlings that will be distributed for planting on both public and private lands in Minnesota. This will result in a greater quality and quantity of timber in the state. Cone purchasing on a statewide level is now done by administrative area. This will enhance seed control. There are presently 14 seed orchards of five species and a total acreage of 78 acres. Five new seed orchards were established in 1984. Other tree improvement activities in FY 84 included the grafting of Scotch pine and white pine (blister rust resistant).

The 1982 Forest Resource Management Act required the Division to submit a Nursery and Tree Improvement Plan to the Legislature describing the benefits and costs of making the Nursery and Tree Improvement Program self-sufficient. This plan was completed and submitted to the Legislature in 1983. The nurseries became self-supporting in FY 85. The state and counties now will buy seedlings from the nursery for planting on public lands.

Forest Roads

The DNR maintains a system of 1,798 miles of forest roads, most of which are within the boundaries of the 55 designated state forests.

The state forest road system exists to facilitate the management, protection and recreational enjoyment of Minnesota's 4.6 million acres of state forest lands. In addition, this road system administered by the Division of Forestry facilitates transportation, commerce and development activities on several million acres of county, federal and private woodlands. Each year some 2,500 loggers, 15 major wood-based industries, and an estimated 600,000 to 800,000 Minnesotans who use the state forests for recreation, hunting and fishing benefit directly from the use and availability of state forest roads.

A number of new and varied demands have emerged to dramatically alter the scope and character of the state's forest road program since its inception nearly half a century ago. These demands include changes in forest land management and protection practices, advances in timber harvest technology, expanded interest in wildlife management, increased need for rural fire protection and increased demand for outdoor recreation. Many state forest roads and bridges, designed and built in the 1920s and 1930s, cannot adequately or safely meet the present or projected demands placed upon them.

In 1982 the Division of Forestry completed a State Forest Road Plan which detailed the needs for construction, reconstruction and maintenance of state forest roads. The Division will reevaluate and adjust the recommendations in this plan as it develops management plans for the 19 administrative areas.

The Legislature increased funding for state forest roads for the 1984-86 Biennium based on needs established in the State Forest Road Plan. A report on transportation limitations to the forest industry will be completed in August 1984 and submitted to the Governor's Sub-Cabinet for review. Ongoing funding of the state forest road system is necessary to address these limitations and to adequately operate and maintain the roads for the purposes which they serve.

The following activities were completed in FY 83 and FY 84.

<u>Activity</u>	<u>FY 83</u>	<u>FY 84</u>
New construction	8.2 miles	11.3 miles
Reconstruction	41.0 miles	92.5 miles
Maintenance	2,036.0 miles	2,050.0 miles
Bridges replaced	4	4

State Forest Land Administration

The Division of Forestry administers more than 4.5 million acres of the approximately 5.4 million acres of state-owned land. Much of this acreage was originally acquired as School Trust, Swamp or trust fund land from the federal government. Other land was acquired through reclamation of submarginal agricultural lands during the 1930s, transfer of county tax-forfeited lands, or fee title acquisition for special purposes. The State Constitution and statutes provide the authority for the Division's land management activities; including acquisition, sale, lease and exchange authority.

Acquisition of land for forestry purposes still occurs, though present acquisition efforts are selective and aimed primarily at consolidation of forest management units. Acquisition this Biennium was concentrated in the Richard J. Dorer Memorial Hardwood State Forest. Six parcels, totalling 303 acres were acquired at a cost of \$163,601. These tracts were identified in the ten-year plan for acquisition and represent transactions with willing sellers.

The 1982-84 biennial appropriation for state forest land acquisition was raised to \$470,000 from the previous amount of \$200,000. This increase still represents a greatly reduced funding level from past years. Though the \$470,000 was approved as of July 1, 1983, no bonds were sold or funds allocated for acquisition until July 1, 1984. Consequently, forest

acquisitions for the 1982-84 reporting period utilized only the balance of the \$200,000 appropriated by the Legislature in 1981.

In the area of the Richard J. Dorer State Forest in southeast Minnesota, at any given time the Division of Forestry has had a list of willing sellers in excess of 100 landowners. Acquisition efforts in the second half of this reporting period were directed at prioritizing this list of willing sellers to a dozen key parcels that will be purchased when funds become available.

The goal of the Division's land administration program is to maintain a state forest land ownership pattern that will provide for efficient multiple use management of forest resources. Management plans being developed for the Division's 19 administrative units will review the land base and recommend future disposition of DNR-administered lands which will further this goal. Recommendations will include sale of land, exchange of state land for other public land, internal transfers of administrative control, and acquisition of land.

Timber Management Program

The Division of Forestry has been directed by the Commissioner of Natural Resources to manage and sell timber on all lands under the control of the DNR. The goal of the Division is to maintain these lands in the appropriate cover types, degree of stocking, and rate of growth to secure optimum public benefits according to multiple-use, sustained-yield principles. At the same time, the Division will continue to supply its market share of timber harvested to meet future demands. Management will conform with the purposes for which the lands are held and with all laws, regulations, and instructions of the Commissioner.

This program includes two major functions: timber stand regeneration and regulation of harvest. The basic function of the timber stand regeneration program is to coordinate timber harvest and regeneration plans to assure state lands are maintained in appropriate cover types to meet future multiple-use needs. The major function of regulating harvests is to promote sustained yields of forest products. These functions are accomplished through coordination of timber scaling, timber sales, timber harvest, stand regeneration and stand maintenance.

During FY 83 the DNR reforested 13,780 acres of state-owned land. Of that total, about 3,000 acres were aerial seeded by helicopter in order to restock areas too difficult to plant. The remaining 10,780 acres were planted with tree seedlings, or seeded by snowmobile and by hand. The Department applied herbicide to about 5,800 acres of state-owned land to protect established conifer plantations from competing vegetation.

During FY 84 the DNR reforested 15,650 acres with 9.4 million seedlings and about 500 pounds of tree seed. To protect individual plantations or natural stands from undesirable vegetation, the Department found it necessary to apply herbicide to 6,200 acres. During FY 83 more than 22,500 acres of state land administered by the DNR was harvested for timber products. As the economy climbed back from the recession, the harvest on state lands increased to 24,900 acres in FY 84.

The past two years brought a general improvement in the timber industry. A drastic slump in the housing industry during the previous Biennium had caused a significant drop in timber demand. This downturn reversed and the total timber demand is back to 1980 levels. A large part of the recovery is due to expansion in the waferboard industry. The full effect of the plant expansion was felt in 1984 when the aspen demand increased almost one-half million cords.

Some long-term trends are indicated in the timber sales. Most of the increase in volume sold has been in aspen. This is the result of the waferboard expansion and a change in the paper industry to using a large percent of hardwoods. The aspen percentage of the total volume sold has increased from about 20 to more than 50 percent in the last 20 years. The softwood percentage, particularly spruce, has dropped drastically. Since aspen is cheaper than softwood, the average price per cord sold has decreased somewhat in the last five years.

State timber sales remained about the same from 1982 to 1983 but increased more than 25 percent in 1984 -- to 540,000 cords (close to the 1980 sales volume). The value of the timber sold increased from the previous Biennium by 18 percent, to nearly \$3,274,000.

If the housing industry makes a normal recovery, the volume of timber sold should increase substantially in the coming Biennium. Along with the increase in demand there should be a slight increase in the average price per cord.

Some minor legislative changes were made in 1984. Authority was given to the Commissioner to grant a special extension to a timber permit holder in certain hardship cases. The use of the extension will be quite limited.

County Assistance Program

The County Assistance Program (CAP) was established under the Iron Range Resources and Rehabilitation Board (IRRRB) to assist counties in managing their forest lands pursuant to M.S. 282. The Division provides professional forest management support to 18 counties in their efforts to intensify the multiple-use, sustained-yield management of 2.8 million acres of county tax-forfeited forest land. Nine CAP foresters were assigned to work full time in nine counties. These counties reimbursed the state for 50 percent of the salary of the CAP foresters, returning about \$120,000 to state general revenue in FY 84. CAP foresters assisted counties with land and timber sales transactions, tree planting, forest inventory, ownership mapping, aerial photo interpretation, and forest road development.

Lake and Pine counties received CAP assistance in completion of resource management plans for their tax-forfeited lands. These plans committed Lake and Pine counties to increase their management of county lands and each county added staff to implement the plans. The Louisiana Pacific Wafer Board Plant being built in Two Harbors will rely on Lake County to implement its plan in order to purchase county timber for its new plant.

The IRRRB funded about two-thirds of the CAP budget in FY 83. General revenue funded the entire budget in FY 84. The CAP's budget of about \$200,000 each year translates into a \$.07 per acre cost of assistance. With this help,

each year of the Biennium the counties provided more than 400,000 cords of timber to Minnesota forest industry, planted nearly 5 million trees to improve county forests, and issued more than 2,000 fuelwood permits.

The CAP program also administers \$570,000 of federal Boundary Waters Canoe Area Wilderness Forest Management Assistance grants. This program provides funds to 13 counties for intensified softwood production and hardwood utilization on county-administered lands in northern Minnesota. In FY 84, the counties accomplished 5,704 acres of reforestation, 551.5 acres of timber stand improvement, and 30.7 miles of forest road construction and maintenance.

Private Forest Management Assistance

In Minnesota, approximately 41 percent of all commercial forest land is owned by non-industrial private forest landowners. The 5.6 million acres which is categorized as Non-industrial Private Forest (NIPF) land holdings is owned by approximately 120,000 individuals who have widely varied land management objectives and interests. Potential productivity of these forest lands is greater than that of other ownerships in Minnesota, therefore they supply more than their proportionate share of forest products to wood-using industries in the state. Many tracts are in poor condition and need reforestation and timber stand improvement.

Recognizing the importance of NIPF lands to industry, recreationists, wildlife, and the general economy of the state, the Division of Forestry has made a commitment to help landowners better manage their forest lands. Also, the Legislative Commission on Minnesota Resources (LCMR) provided funding for an Accelerated Private Forest Management Program. Funding of 15 full-time forester positions was provided, and the program proved so successful these positions were converted to general funding last Biennium.

A total of approximately 80 person years was devoted to the Division of Forestry Private Forest Management Program during the Biennium by Division foresters. They provided professional forestry technical assistance to NIPF landowners, specifically regarding management planning, timber sales, reforestation and timber stand improvement. During this Biennium more than 14,000 individual landowners were assisted. These assists resulted in reforestation of more than 16,000 acres, 7,000 acres to timber stand improvement, and general management planning for over 200,000 acres. Additionally, approximately 900 landowners were provided timber sales assistance resulting in the harvesting of more than 16 million board feet of forest products during the Biennium.

Future efforts for the Private Forest Management Program will include working with local Soil and Water Conservation Districts, consultants, and industrial foresters in a cooperative effort to increase landowner contacts and accomplishments. Also, the Division will indirectly impact land management decisions through increased information and education efforts.

Urban Forestry

The goal of the Division's urban forestry program is to assist cities, towns, and suburbs in maintaining and improving their community forests and to assist private homeowners in growing trees or associated plants for

ornamental, aesthetic, or conservation purposes. To accomplish this goal, the Division has used matching dollars from the U.S. Forest Service's State and Private Forestry Program to fund an urban forestry specialist.

The main thrust of the program has been to train the Division's field foresters so they are capable of giving technical assistance in urban forest management and planning. Involving this network of foresters has enabled the small urban forestry program to expand its efforts so that thousands of homeowners and more than 100 communities are assisted annually.

For several years, the urban forestry program has been responsible for promoting Arbor Day. A ceremony is held on the last Friday in April at the State Capitol. A tree commemorating a certain person or event is officially planted and 26 Minnesota communities are awarded TREE CITY USA recognition. TREE CITY USA is a community improvement project sponsored by the National Arbor Day Foundation that has been designed to identify those municipalities effectively managing their tree resources.

Schools seem to have the most widespread observance of Arbor Day. Contributions made by several of Minnesota's forest industries have helped the Division provide approximately 2,200 schools with materials for Arbor Day. A poster encourages students to "plant trees for the generations to come" and a pamphlet explains how trees have been important to mankind since ancient times.

Besides providing foresters to assist at municipal and school Arbor Day ceremonies across the state, the Division makes available free seedlings to communities, schools, and non-profit civic organizations. By state law these seedlings are to be used to establish or reforest woodlots, windbreaks, and shelterbelts or used for erosion control, soil and water conservation, or permanent food and cover for wildlife.

The Urban Forestry program maintains the records for Minnesota's Native Big Tree Registry. Champion trees representing 52 species have now been recorded. Any school district or municipality may, by state law, establish and maintain forests. These forests, again by state law, must be inspected annually by a Division forester. There are 80 such forests in Minnesota. Maintaining their records has become a responsibility of the urban forestry program.

For four years (1978-1981) the states of California, Colorado, Georgia, Minnesota and Wisconsin participated in a federally funded Dutch elm disease management and utilization program. The objectives of this assistance program were to make available, on a nationwide basis, information and education to municipal governments and individual homeowners on the history, incidence, severity, and management of Dutch elm disease; to make information and education available on the utilization of elm trees infected and killed by Dutch elm disease; and to establish and maintain, in selected areas of the United States, demonstration sites to show the application and results of effective Dutch elm disease management and utilization programs.

The federal demonstration program was terminated at the end of 1981. Since then, a grant of \$50,000 has been used by the urban forester to write three final reports for all five participating states.

The first was the State Summary Report, 1978-1981. The program's national success story and impact within each of the participating states was outlined in this report. It was sent to the legislators of the participating states, all state foresters, and the extension offices of all 50 states.

The second report was a summary of the first. This condensed report highlighted the program's major accomplishments and was given to all federal legislators to inform them of how the grant monies had been used for the four years of the demonstration program.

The "Dutch Elm Disease Management Guide" was the third, final product of the demonstration program. This 24-page, illustrated publication explained the various practices that can be used in a disease management program. Readers have learned which practices are fundamental to a community's program and how to assign priority to those non-essential practices that further reduce tree losses and/or improve program cost-effectiveness. The practices discussed in this publication can be used to develop management programs that can be applied not only to Dutch elm disease but to other tree diseases and all aspects of urban forestry as well. This publication is being distributed nationwide.

Forest Inventory Program

Accurate forest resource information is essential for effective management and proper utilization of the forest resource. The Division of Forestry has two forest inventory systems which provide up-to-date, reliable forest resource information.

One system involves a relatively rapid method of sampling the state's forest resource on all land ownerships, to statistically estimate the extent and condition of the resource. Statistical information is collected from about 10,000 permanent one-acre plots, randomly distributed throughout the state. This survey, partially funded by the U.S. Forest Service, is essential for multiple use forest resource planning by both resource managers and resource users.

Information developed from the last survey was instrumental in more than \$750 million in forest industry plant expansion, which resulted in an estimated 900-1,000 jobs within the industry and 300 new jobs in the woods.

A number of publications regarding the state and county forest resources are available from the U.S. Forest Service or the DNR.

The last survey began in 1974 and was completed in 1977. A periodic updating on a ten-year basis is necessary. A re-measurement is scheduled to begin in 1985. Planning for the re-inventory was completed in 1984.

The second inventory system is an on-the-ground examination of all forest stands on state and county lands. This inventory provides the information needed by the forest manager to properly manage the forest resource. The forest inventory of seven million acres of state and county land is scheduled for completion in 1985. Field work has been completed on a total of six million acres.

During the Biennium, inventory projects were in progress in Aitkin, Pine, Crow Wing, Cass, Koochiching and Lake counties and a number of state forests. Inventory has now been completed on all state and county lands in Hubbard, Beltrami, Clearwater, Wadena, Becker, Crow Wing, Aitkin, Mille Lacs, Carlton, Kanabec, Lake and Cook counties and on both state and county lands in 46 of the 55 state forests.

A special detailed survey of private lands began in Aitkin and Carlton counties. This survey, which is very extensive, is being done in cooperation with the Soil and Water Conservation districts of the two counties. Most of the data is obtained through photo interpretation and the use of various computer models. The data is general in nature but will identify both the resource availability and development needs of those counties.

Forest Products Utilization and Marketing

The goal of the Utilization and Marketing Program is twofold: 1) to expand the use of currently under-utilized wood resources through marketing and economic development; and 2) to increase the utilization of the wood resource through improved harvesting and processing efficiency. To meet these goals the program provides technical assistance in primary processing, secondary processing, resource analysis, industrial development, wood energy, wood by-products and timber harvesting.

The past two years have been very good for the industry. The industry operated near capacity to meet the heavy demand for lightweight coated papers produced by Minnesota companies. During the past two years the four waferboard and oriented strand-board plants also operated at near capacity. By the spring of 1985 an additional waferboard plant operated by Louisiana Pacific, will begin production at Two Harbors.

Sawlog production from Minnesota sawmills remains stable. However, severe softwood lumber competition from western Canadian mills is forcing some of the larger mills to shift from pine to hardwood and aspen production.

Conversion of business, industrial and institutional buildings to wood heat has proceeded rapidly during the past two years. Since 1979, more than 180 significant conversions, including 56 schools, have occurred. Many of these conversions are utilizing densified fuels in the form of wood pellets and briquettes. The use of wood fuels for energy conversions is likely to double in the next two years.

Economic development and expansion of Minnesota's forest industry has been a significant goal of the administration. The utilization and marketing staff has been called upon to provide assistance and resource information to many delegations from foreign countries. The utilization and marketing staff works closely with the Governor's staff and the Minnesota Trade Office to offer assistance for economic growth in Minnesota.

Reports prepared during FY 83 and FY 84 include:

- * "Status of Wood Energy Use in Minnesota"
- * "Analysis of the Private Forest Plantations in Minnesota"
- * "Conversion of DNR Buildings to Wood Energy"
- * "Timber Resource Analysis of Babbitt and Two Harbors Sites"
- * "Increasing Wood Fuel Use in Minnesota"

- * "Minnesota Wood Product Opportunities"
- * "White Birch in Minnesota"

Numerous publications relating to specific mill and industry requests also were developed.

Management Information Systems

Division personnel require complete, timely, and accurate information to perform all of the varied functions assigned to them. The majority of the information needs in the Division revolve around land management activities and management needs. This information is required in many different levels of detail and formats, depending on the users' interests, concerns and responsibilities. It is the goal of the Division's Systems Unit to provide this information. The following tasks are performed to further this goal: evaluating hardware and software; training the users of the computers, systems, and user software; identifying problems; assisting users; and developing systems.

Funding from the Legislative Commission on Minnesota Resources has enabled the Division to complete the following: development of a forestry systems plan; acquisition of computers for the Region and Area offices; purchase of user software for the field computers; and development of seven systems -- land resource, nursery tree ordering, harvest planning, timber sales, message sending, training records, and the fire status reporting system.

As more systems are developed, an increasingly large portion of time will be spent on system maintenance. Continued progress will be made to develop systems to meet the Division's needs.

Forest Resources Planning and Environmental Review

The forest resources planning program exists to provide strategic and forest land management planning assistance to the Division of Forestry and the Department of Natural Resources. This program is designed to provide direction and coordination for the Division's resource management programs and to provide resource management information for resource managers, legislators, and the general public.

The Forest Resources Planning program began in July 1981 when the Legislative Commission on Minnesota Resources funded the program. The goal of the program the first two years was to develop a comprehensive, statewide forest resource plan to provide for sound management, protection and utilization of Minnesota's forest resources. This plan, completed in FY 83 and known as the Minnesota Forest Resources Plan (MFRP), consists of the following seven documents: Planning Concept; Issues; Assessment; Goals and Strategies; Objectives and Recommendations; Program and Budget; and Annual Budget Implementation.

Volumes 1 and 2 describe the planning concept and identify forestry issues facing the state. Volume 3 provides an overview of the forest resource in Minnesota, including past, present and future conditions. Volumes 4-7 comprise the program portion of the plan. Volume 4 sets long-term goals for ten major issues addressed in the plan and describes general strategies for

resolving these issues. Volume 5 lists specific actions designed to implement the strategies, presenting both Division of Forestry objectives and recommendations to the agencies and forestry organizations. Volume 6 describes objectives for the Division's programs through 1989, including estimated budget and staffing needs. Volume 7 is the first of a series of annual work plans used to implement the MFRP. These will be done at the beginning of each fiscal year, setting the objectives and budget and staff level for the following year.

Development of the MFRP required cooperation and involvement of state and federal agencies, private landowners, county forest managers, the University of Minnesota and private industry representatives.

During FY 83, the forest planning staff, in cooperation with other Division personnel, began preparing forest resource management plans for the Division's 20 administrative areas. These plans will include recommended management strategies on Division of Forestry lands, as well as a description of the Division's programs as they apply to the particular area. The program portion of the plan will include goals and objectives for each program and a ten-year plan for implementing the goals and objectives.

Forest planners serve an important support role within the Division by assisting St. Paul and field staff in drafting policy statements, preparing operational manuals, and conducting various other special projects. Some of these special projects completed during FY 83 and FY 84 include the following: Administrative Realignment Plan; State Forest Boundary Realignment Plan; Wildlife/Forestry Cooperative Agreement; Lake States Work Group Study; Lake and Pine County Plans; County Assistance Program Reorganization Plan; State Forest Recreation Sub-Area Plans; Division Reorganization Plan; and Annual Work Plans.

Planners also represent the Division on interdisciplinary planning and coordinating teams, and coordinate state and federal forest resource management in Minnesota.

The major interdisciplinary activity of the Planning Program is associated with the DNR Planning and Environmental Review Team (PERT). A forest planner is the Division designee to PERT, to represent the Division in reaching departmental policy consensus on environmental review matters; long-range comprehensive natural resource plans; management plans for recreational units; proposed environmental legislation and rules; and all formal departmental policies.

The future objectives of the Planning Program are to maintain and update the MFRP every four years; develop management plans for administrative areas; and provide administrative support to the entire Division.

* * *

MINERALS RESOURCE MANAGEMENT

The Department's Mineral Resources Management program, conducted by the Division of Minerals, provides for the management of the ten million acres of state-owned trust fund, consolidated conservation fund, and tax-forfeited mineral rights; and some three million acres of state and county peatlands. The Division is also responsible for mineland reclamation and explorer registration on all lands in Minnesota.

During the Biennium, the Department was also given responsibility for several new or expanded programs. Expanded programs included \$500,000 for copper-nickel test drilling, and \$2 million for peat development, detailed peat surveys, environmental monitoring, reclamation field work and rules development. Two new programs were also funded: \$600,000 was appropriated for mineral research and \$1.5 million for direct reduction research.

Management activities include: mineral and peat leasing; mineral potential evaluation studies; test drilling; identification and encouragement of peat development opportunities; environmental monitoring of peat mines; development of peatland reclamation rules; recommendations on land-use management; environmental review of mining projects; research toward minimizing mining impacts; research on direct reduction of iron ore; studies of severed mineral ownership; regulation of the effects of mining; explorer registration; maintenance of exploration data and drill core library.

Division of Minerals' goals are to provide equitable rental and royalty income from the exploration and development of mineral rights and peatlands for the trust funds and local taxing districts, while insuring that mining operations are conducted in a manner that results in usable, hazard-free lands, following cessation of mining activities. It is also the Division's goal to insure that mineral and peatland development opportunities are achieved in areas where environmental impacts are minimized and economic opportunities maximized.

The program must also provide technical support to other state agencies, to its federal counterparts, and to the counties with mineral and peat potential; and handle public inquiries about these resources. These activities are coordinated with the overall natural resource management responsibilities of the Department.

State mineral ownership includes more than 18 percent of the Mesabi Iron Range, and a large share of the copper-nickel resource in the Duluth Complex. The approximately 10 million acres of state-owned mineral rights administered by the Division are located mostly in the northern part of the state. These include School and University Trust Fund, acquired, and tax-forfeited mineral rights. Under Minnesota's mineral laws (M.S., Chapter 93), these mineral rights are not sold. State lands believed to have mineral potential are leased at public sale, or in certain cases, by negotiation. Royalty is paid to the state on ore mined or concentrate produced. These mineral leases also provide for annual minimum rental or royalty when no ore is mined. It is estimated that during the current Biennium (FY 84-85), more than \$5 million will be collected in rentals and royalties.

Through its Peat Program, the Division manages the state's vast peat deposits. Of Minnesota's approximately six million acres of peatland, nearly half is in state or county ownership and under the Department of Natural Resources' overall management authority (M.S. Chapter 92.50). Most of the extensive contiguous peat deposits occur in the northern half of the state, especially in Koochiching, Lake of the Woods, Beltrami, Aitkin, St. Louis, and Carlton counties. Many of the peatlands are in trust fund, consolidated conservation, or tax-forfeited ownership. Commercial peatlands, like mineral rights, may not be sold but may be leased through negotiation or public sale. Royalties and rental are charged for peat extraction, and rental is charged for non-extractive use (rice paddies, agricultural crops, hay lands, etc.). Recent peat leases include provisions to encourage production, and the stipulation that reclamation of mined peat areas occur promptly following mining.

Growing interest in Minnesota's metallic and nonmetallic mineral potential and in peatlands; the changing economics of the various mineral industries; and the development of new technology for mineral processing, reclamation, environmental protection, and evaluation of environmental and socioeconomic impacts all combine to make the Minerals Resource Management Program a diversified and innovative activity.

Iron Ore and Taconite

Iron ore and taconite from the Mesabi Iron Range dominate the mining scene in Minnesota. Of the United States' capacity of 95.2 million tons of iron ore pellets, Minnesota's eight taconite plants have a combined annual production capacity of 64.25 million tons. The maximum production to date occurred in 1979, when 56.2 million tons of pellets were shipped from Minnesota. Production of ore during the Biennium reached its lowest point since 1938 (at 24.00 million tons in 1982) due to a surplus of pellets and the downturn in the economy. In 1983 production was up slightly at 31.52 million tons.

The state, through its trust fund and tax-forfeited mineral ownership, owns approximately 19,600 acres on the Mesabi Iron Range, or about 18.5 percent of the area. State-owned taconite represents a substantial portion of the reserves of all eight taconite operations. During the Biennium, a total of 40.5 million tons of state-owned natural iron ore and taconite was mined to produce taconite pellets and iron-ore concentrate. The state's rental and royalty income received during this period was as follows:

Trust Funds	\$1,694,000
Acquired State Forest	22,200
General Revenue	173,000
Taxing Districts	723,100
Special Advance Royalty	910,800
Consolidated Conservation Area Fund	42,100
TOTAL	\$3,562,500

Of this total, \$413,000 was received as rental from state copper-nickel leases. These are discussed in the section on "Nonferrous Minerals."

Direct Reduction of Iron Ore

At the Governor's request the Legislature approved \$1.5 million for investigation of direct reduction technologies as part of his 1983 budget request. Four projects have been funded as part of the Direct Reduction Program. These are: investigation of building an INRED iron-making facility next to and operating it in conjunction with an electric generating plant; development of Minnesota taconite fluxed pellets as an improved blast furnace burden material; Grate-Kiln modification study; pilot-plant test of the KR coal reduction process.

The INRED process uses fine iron ore concentrates to produce "hot metal." The purpose of the study was to determine if an INRED facility could be integrated with an existing electric generating station. This would result in a capital cost savings because pollution control equipment would not need to be duplicated. Potential markets for pig iron were also investigated to determine whether the economics of a Range location looked favorable. A second phase was to begin after the 1983 fall testing program of the INRED pilot plant at Lulea, Sweden. However, the program was not successful, and further investigation of this process was stopped.

The fluxed pellet study was initiated to develop basic data on fluxed pellet reducibility. The work was organized as a series of experiments in which small quantities of pellets were produced with various additives and subsequently studied to determine their chemical and physical properties. The purpose was to estimate the value of fluxing at the pelletizing plant as a way to increase the productivity of pig-iron production at the blast furnace. This work is still underway, so final results are not yet available. Interim results indicate that fluxing creates pellets with superior properties, but it is too early to determine if the benefit-cost ratio is sufficiently great.

The Grate-Kiln modification study was initiated to determine if existing grate-kiln pelletizing lines could be modified to produce sponge iron, such that the off-gas from sponge-iron production could be used as the fuel source in other pelletizing lines at the same plant. Solid phase reduction of iron ore in an atmosphere rich in carbon monoxide and hydrogen is a well-known technology.

Past studies have shown that it would not be economical to construct a "greenfield" plant to produce sponge iron. However, the possibilities for modification of existing facilities could provide economic advantages. On a site-specific basis this work is being completed with cooperation of two plant operators to determine the feasibility of modification. This study is also underway, so results are not yet available.

Experimental work with the KR process has generated the most interest and success to date. DNR's involvement with the KR process began with an internal evaluation of "hot metal" processes to determine which were closest to commercialization. Hot metal processes were chosen because they appeared to have the best chance of success in the long run because of the elimination of the blast furnace and melting in an electric arc furnace.

Three processes were identified: INRED, Plasmasmelt, and KR. Each of the processes approaches the reduction problem in a different way. INRED uses a submerged electric arc to achieve the final reduction and melting;

Plasmasmelt uses an electric torch that gives a very localized high temperature zone; and KR separates the reduction and melting reactions into two reactors which are connected. Coal is the primary energy source and the source of reducing gases in all three processes. However, KR is the only process which does not depend on electric energy to achieve the final reduction and melting.

The KR process is wholly owned by Korf Engineering of Dusseldorf, West Germany. Korf Engineering is offering to build 300,000-ton-per-year commercial KR plants, and in order to attract interest and customers it operates a 6-ton-per-hour plant at Kehl in West Germany. The state sponsored a 14-day trial of U.S raw materials in the pilot plant. Minnesota taconite pellets were chosen as the iron source, and a West Virginia low-volatile coal was used as the energy source. The test was run between October 27 and November 12, 1984.

The plant ran well for the last 10 days of the trial period; the process exhibited stability and responsiveness; and the quality of the iron produced fell into the range of what would be expected from blast furnaces. The success of the trial prompted the state to pursue this process further and enter into a cooperative agreement with Korf Engineering to develop a proposal for construction of a KR demonstration plant in Minnesota.

While this is a new program, it appears that three of the projects begun promise significant results in aiding Minnesota's iron mining industry.

Nonferrous Mineral Potential and Test Drilling

In addition to its iron ranges, Minnesota has other rock formations that are receiving considerable attention for their mineral potential. Minnesota has a variety of geologic environments that favor the occurrence of nonferrous minerals. The Division had an active nonferrous mineral leasing program from 1966 through 1973. During this period the state held six nonferrous lease sales, at which a total of 2,143,923 acres of state-owned mineral rights were offered for leasing. These resulted in the issuance of 1,044 leases, covering 425,313 acres, to 22 companies and individuals. The leases covered lands in the counties of Beltrami, Cook, Itasca, Koochiching, Lake, Lake of the Woods, Marshall, Roseau and St. Louis.

In addition, two negotiated leases covering 400 acres were awarded during 1981 and 1982 in Beltrami County. Most of the leases issued in the period 1966 to 1973 were terminated by the companies after evaluation, leaving only 17 leases covering 4,849 acres in Beltrami and St. Louis counties.

During the Biennium the Division conducted two very successful lease sales. The first (November 22, 1982) covered 1.73 million acres in Beltrami, Itasca, Koochiching, Lake of the Woods, Marshall, Roseau and St. Louis counties. This sale resulted in the issuance of 419 leases covering 186,730 acres to 11 companies and individuals. The second sale (November 15, 1983) covered 1.09 million acres in the same counties plus Cook and Lake counties. This sale resulted in the issuance of 355 additional leases covering 155,801 acres to 13 companies and individuals. At no time in the history of nonferrous mineral leasing has the acreage under lease been this high. On June 30, 1984, a total of 709 leases remained active covering 309,606 acres.

Lease sales of this type are each expected to generate approximately \$10 million of exploration activity in northern Minnesota.

The Division of Minerals is responsible for evaluating the mineral potential of the approximately ten million acres of state-administered mineral lands. Of all the natural resources in Minnesota, minerals are the most difficult and costly to examine and evaluate. At present, adequate data to evaluate mineral potential are available on less than five percent of the state's land. Often the Division is not able to prevent land uses that preclude future exploration and mining of minerals, even though adequate mineral data do not exist.

The two lease sales held during the Biennium have stimulated a considerable amount of nonferrous mineral exploration. During this period, 11 of the 19 licensed explorers drilled 112 holes on lands in 11 counties.

The data submission requirements of the state copper-nickel lease and the Exploration Bill are significantly increasing the geologic "data base" for those parts of the state where the bedrock is concealed by glacial overburden. This information is not only adding to the geologic understanding of the state but is providing an important stimulus for mineral exploration. A total of 82,500 feet of drill core from donations, previously drilled state leases and drill core turned in under the Exploration Bill was received and classified during this Biennium.

The present geologic "data base" consists of more than 500,000 feet of nonferrous drill core sample representing 1,000,000 feet of iron ore and taconite drilling, and several thousands of data files. The information has been gathered from a variety of sources; terminated leases have been the single most important source. The use of this "data base," especially by explorers, has increased considerably, and for this reason efforts have begun to computerize this information to make it more readily available to everyone.

State mineral leasing programs contribute a large amount of expensive minerals data, but it is also necessary to obtain data in areas not of current interest to industry. A concentrated effort has been made to evaluate mineral potential in response to the many land-use decisions the Division has been required to make. Several major mineral-potential studies and surveys have been conducted in portions of ten northern counties during the Biennium. Fifty-six line miles of geophysical surveys were conducted, and 1,787 mineral samples were collected and evaluated. The chemistry laboratory in Hibbing made 88,805 chemical determinations on samples of soil, rock, lake sediments, drill core, iron ores, peat, and water.

To assist in mineral potential evaluation and environmental analysis, the Legislature funded a drilling program. During this Biennium, five holes were drilled. While all of the drill holes helped in determining mineral potential, one in particular produced significant results. This was drilled in the Duluth Gabbro Complex in Lake County, and significant copper mineralization was disclosed. The hole was drilled many miles from any known economic mineralization and away from known company exploration activity. Several companies have since moved into this area and are currently conducting mineral exploration.

A number of other programs have been funded by LCMR and through legislative appropriations in order to aid in mineral-potential evaluation. Some have been conducted by the Division, while others have been contracted. Projects conducted by Division staff include lake sediment surveys, water well sampling, geophysical surveys, and geologic drilling in east-central Minnesota. Significant gold mineralization was encountered in a DNR drill hole in the Ranier area of northern Minnesota. Work done in the Ranier area includes geochemical sampling, geophysical surveys, and geologic drilling.

There has been some field geophysical work done in the Duluth Complex as well as considerable second derivative filtering of aeromagnetic data in the Duluth Complex. Other work done in the Duluth Complex includes a reconnaissance heavy minerals geochemical survey and a study of the origin and occurrence of titanium mineralization done for a Master thesis. This work resulted in the selection of a drill hole that encountered significant copper and nickel mineralization.

The projects that have been contracted out include a computerized reduction of gravity and aeromagnetic data by the Minnesota Geological Survey and an investigation of chrome-bearing diamond drill core by the MRRC, all in the Duluth Complex. Other projects contracted out include: (1) a saline brines study in North Shore volcanic rocks; (2) structural study of the Duluth Complex; (3) litho-geochemistry of Keweenawan rocks in northeastern Minnesota and of other rocks in east-central Minnesota; and (4) a public sample analysis program.

Peat Program

The past two years have been productive and exciting ones for the Peat Program. Activities can be described in two categories: (1) those efforts devoted to the management of the peatlands, regulation of peatland development, and the protection of ecologically significant peatlands; and (2) those activities concerned with the encouragement and support of peat-based industries in Minnesota.

With respect to the first category, the Peat Program has increased its capabilities in computer mapping and site-selection work. We have expanded the number of variables considered in identifying peatlands available for development. For example, our computer maps of peatlands now consider transportation factors (distance from towns and roads), land management factors (parks, wildlife refuges, ownership and others), and peat characteristics (depth and type of peat). Our computer inventory maps now cover more than four million acres of peatland.

Equally important is the recent activity in detailed field work for site selection. Peat Program inventory crews now routinely survey prospective peatlands with a degree of accuracy just short of that needed to lay out mining sites (a task properly left to private developers). Several suitable peat mining sites have been developed and are available to interested prospective developers.

One outcome of the site-selection work has been the successful leasing of several new peat mining areas, three for horticultural production and one for fuel peat production, for a total of 5,925 acres. Two of the leases contain

tax-forfeited lands as well as DNR-administered lands and were leased through a joint powers agreement with Carlton County.

The lease for fuel peat production represents the first major fuel production operation in the state and an important benchmark in the development of the industry. The Rasjo Torv Company of Sweden is the parent company in this development, and their Minnesota subsidiary, the Great Lakes Peat Products Company, harvested 10,000 tons of peat in the first (experimental) season. The Peat Program and Great Lakes Peat Products Company have cooperated in testing programs for peat combustion, water monitoring program, and, at the outset of the project, a shared resource inventory effort employing both Peat Program field staff and the company's staff.

A major program effort during the Biennium was development of recommendations for the protection of ecologically significant peatlands. Since 1978, when peatland energy development proposals for large acreages were first being considered, staff and university faculty have completed a number of field investigations and other studies to identify and classify those peatlands in Minnesota of greatest ecological significance. This work has resulted in the identification of the most representative of patterned peatlands greater than 3,000 acres and recommendations for designation and management of these 18 areas based on their relative significance.

A preliminary report on the program's findings was published in June 1984. A final report and recommendations will be issued for the 1985 legislative session.

With respect to the second category, the program greatly expanded its marketing and testing program with the monies appropriated by the Legislature. These efforts have begun to make significant progress toward the creation of viable peat-based industries in the state. There are five aspects to this part of the program.

Market Definition. Analyses have been completed for both fuel and horticultural peat marketing. The horticultural marketing work has been done cooperatively with the Arrowhead Regional Development Commission and the Natural Resources Research Institute. This work concentrates on the identification of markets for Minnesota horticultural products and the improvement of the image of Minnesota peat products, based on the eventual development of qualitative standards by member industries. The potential for fuel peat use was determined early in the program, based on a survey of potential users, determination of the volume of current use of traditional fuels, and an assessment of the technical feasibility of the use of peat fuels in existing facilities.

Peat Combustion Testing. A number of peat test burns were planned and initiated in both power-generating facilities and in industrial plants. A partial list of the participants in these tests includes the Virginia Public Utility Commission; the University of Minnesota, Duluth; the Minnesota Power Company; and several paper companies. This work continues in FY 84 and FY 85.

Gasification Feasibility Testing. Gasification of peat continues to be of interest in connection with some industrial applications and metallic minerals processing. Tests to verify the technical feasibility of peat gasification were successfully conducted at the Bureau of Mines UMD.

Peat Dewatering and Chemical Extraction. Working with the Chicago-based Institute of Gas Technology and Bemidji State University, the Peat Program conducted tests of two dewatering systems (wet carbonization and a mechanical device) and is investigating the economic and technical feasibility of extracting useful by-product chemicals that might augment the economics of fuel production.

State Facilities Conversions. The departments of Energy and Economic Development, Military Affairs, and Natural Resources have entered into a cooperative agreement to study fuel conversions in state-run military installations. Camp Ripley is the first site to be considered for the conversion of two barracks areas and an equipment maintenance area.

Mineland Reclamation

The Division is responsible for the administration of the state's Mineland Reclamation Program. All active taconite and natural iron ore mining operations are required to reclaim their mining facilities before abandonment. This is completed through a permit program administered by the Division.

In addition to the review and granting of permits, the Department is engaged in numerous other reclamation activities.

Revegetation Research. Past revegetation programs are being monitored and evaluated, and new vegetation plot studies are being initiated to determine economic revegetation practices that will comply with the reclamation rules.

Copper-nickel leaching and tailings reclamation research. The Division is conducting several cooperative studies to evaluate reclamation methods for controlling toxic leachate from Duluth gabbro stockpiles. The reclamation techniques being evaluated include revegetation, sludge application, biocide application, and co-disposal of tailings to absorb metals from leachate. Preliminary laboratory studies, conducted to evaluate the ability of peat and tailings to remove trace metals, were favorable. More extensive field studies are now under way. Results are being detailed in progress reports and technical articles.

Mineland Cleanup. The existing mineland cleanup program for removing abandoned and dangerous structures and debris left by past mining operators has been expanded to include removal of tracks and ties from railroad grades formerly used by the mining industry.

Coordination with the Iron Range Resources Rehabilitation Board. Reclamation activities on abandoned and active mining areas and reclamation research projects are coordinated. IRRRB has provided funding and assistance on several reclamation projects.

In 1983 the Mineland Reclamation Act was amended by the Legislature to include provisions for the reclamation of lands affected by peat mining and directing the Commissioner of Natural Resources to promulgate rules by July 1985. The rule-making process was initiated in August 1983 with publication of a Notice of Intent to Draft Rules relating to peatland reclamation. A survey was conducted on the international and national regulations governing peat mining; peatland reclamation literature was reviewed; and data were

collected on existing peat mining operations in the state. Using this information, the staff prepared draft rules and distributed them for review in May 1984.

In June 1984 arrangements were made to visit existing peat mining operations in Minnesota. These site visits provided an opportunity to tour the operation and to discuss the draft rules with the operators. Plans were made to visit several abandoned peat mining plots to observe revegetation success in those areas. In addition, plans were made to tour large and well-established peat mining operations in Canada, Finland, Sweden, and Ireland.

Based on information collected and comments received during the summer of 1984, the Division prepared a second draft of the proposed rules in September 1984 in order to proceed with the rule adoption process. The rules when adopted will provide a permit procedure for peat mining similar to the one used for taconite and iron ore.

The Legislature directed the Division to monitor the environmental impacts associated with the development and operation of a peat mine. A water quality and hydrological monitoring program was initiated in the fall of 1983 at the Great Lakes Peat Products Company's mine near Zim, Minnesota. Water levels in the mining area and surrounding peatlands are being monitored by a network of piezometers to determine mining influence on groundwater levels and movement. Water quality and flow measurements are being recorded at six locations to determine the quality of runoff water as well as the effectiveness of a settling basin used as a water treatment system. Results are now being analyzed and will be made available in 1985 in a report being prepared by the Division.

Future peat activities contemplated by the Division include promulgation of the peat reclamation rules by July 1985, and continuation of the peat monitoring program to develop a long-term data base to establish water quality and hydrological trends.

Industrial Minerals

Recent advances in space-age technology combined with high energy costs and the cyclic swing of prices in metallic minerals has led to a new interest in the development of industrial minerals.

Industrial minerals are generally classified as nonmetallic, nonfuel minerals, usually a bulky commodity of low per-unit value primarily consisting of sand and gravel aggregate, crushed rock aggregates, clay products, marl, and a wide variety of other less common minerals used in specialized industrial processing.

Industrial minerals play a significant role in providing raw materials that are essential for the construction, treatment, and manufacture of our basic commodities and economic growth. Consequently, they represent a stable factor in our economy that is not subject to the cyclical extremes in other industries.

The Division of Minerals has responded to the new demands in industrial minerals by expanding its activities in this area. Currently the Division is cooperating with the U. S. Bureau of Mines Minnesota Clay Project in northern

Minnesota. The purpose of this study is to locate a Montmovellinite clay that can be substituted for Wyoming bentonite as a binder in the manufacture of taconite pellets. Five different glacial lake terrains have been drilled and sampled. Laboratory analysis is now under way. Development of a native clay deposit would contribute a new industry to the local economy and result in a considerable saving of transportation costs over the imported bentonite.

Recently the Legislature took action to protect valuable gravel lands from unwise zoning and development. Under the Laws of Minnesota 1984, Chapter 605, the Department of Natural Resources is named as the lead agency in a cooperative program with the Minnesota Department of Transportation, Minnesota Geological Survey, and the State Planning Agency, to conduct an ongoing inventory of sand and gravel deposits. This legislation requires a long-term statewide program to identify, classify, compile, and distribute aggregate resource data. In turn this information is supplied to local governments for use in their zoning decisions.

Space-age technological demands for new products require that the Division of Minerals make a concerted effort to conduct a program to evaluate the potential and marketability of industrial minerals used in the diverse processes and products in the plastics, metallurgical, paper, and energy industries. The scope of this program is still being formulated but is envisioned as being a interdepartmental effort with the Department of Natural Resources as the lead agency.

The mineral potential of Minnesota's varied geologic terrain promises that industrial minerals will play a significant role in our economy, as they have in the past.

Severed Minerals

The Severed Mineral Interests Law, as amended in 1973 and 1979, requires every owner of an interest in minerals owned separately from the surface of the property to register such interest with the appropriate county recorder or county registrar of titles. Such severed mineral interests are also subject to an annual tax of 25 cents per acre, per year. Eighty percent of the tax collected goes to the local taxing districts. The remainder is appropriated to an Indian Business Loan Account Fund. More than 2.75 million acres have been registered.

Failure to register ownership of the severed mineral interest, or failure to pay the tax, will result in forfeiture of the severed mineral interest to the state, in trust for the local taxing districts. Large acreages of severed mineral interests have already forfeited to the state for failure to pay the tax, and more will be forfeiting during the next few years.

The Division of Minerals received an appropriation for a program on mineral rights that have forfeited to the state for nonpayment of taxes. The purpose of the program is to provide better data concerning the state's ownership of mineral rights that are held in trust for the local taxing districts. When necessary, information will be provided to the Attorney General's office for the commencement of appropriate forfeiture proceedings.

Activities under this program are concentrated in nine northern counties. Title work is being conducted on specific tracts, and title information from the severed mineral interest registrations is being gathered on a county-wide basis. Surveys are also being conducted statewide to clarify the status of county land and tax records concerning mineral rights.

Another activity concerning mineral rights that is being conducted during this Biennium is the identification of mineral rights received by the state from the former Department of Rural Credit. This state agency had issued loans to farmers in the 1920s. The loans were secured by mortgages, and due to unfortunate widespread agricultural depression in the later 1920s and 1930s, the agency foreclosed on a majority of loans. When the land was subsequently sold, mineral rights were reserved to the state.

In 1983, the County Court in Pope County dismissed a surface owner's claim to the mineral rights the state had reserved when it sold rural credit-acquired land. This led to the transfer of records of the former Department of Rural Credit to the Department of Natural Resources.

The Division of Minerals has been reviewing the legal descriptions of the 1.9 million acres of land covered under the 13,575 loans. More than 300,000 acres of mineral rights that have been reserved to the state have been identified, and the legal descriptions have been coded for addition to the state's land records. Some of these mineral rights will be offered for leasing at subsequent lease sales.

* * *

PARKS AND RECREATION MANAGEMENT

Park Development

The 1983 Legislature appropriated \$7,534,000 for state park development and rehabilitation, of which \$4,084,000 was from Legislative Commission on Minnesota Resources (LCMR) and \$3,450,000 was Resource 2000 (bonding). During FY 83, revenue shortfalls necessitated a cut of \$242,000 in the state park development program, leaving \$7,292,000 in development funds. About one-half of the projects completed were handled by park staff (force account). Other projects were handled by construction contracts through the DNR's Bureau of Engineering.

The development and rehabilitation projects will correct noticeable health problems, such as those involving water and sewage; provide new toilet buildings; and correct safety hazards. Park units will be aesthetically improved through extensive resource management programs for vegetation, wildlife, fisheries and soils.

Examples of newly initiated projects include:

- * Split Rock Lighthouse State picnic and campground development.
- * Tettegouche State Park and Baptism Class 1 Rest Area, which includes a public recreational information center for the North Shore.
- * Completion of Great River Road projects at Itasca State Park and the remodeling of the 1906 Douglas Lodge building at the park.
- * Development of multi-use center at William O'Brien State Park.

The development of state park trails has benefited from the trail assistance program. Trails developed will be used by hikers, cross-country skiers, bikers, horseback riders and snowmobilers.

During the winter of 1983-84, the Division participated in the first cross-country ski license program. Forty-three state parks participated. Income totaled \$52,360; 3,845 people purchased individual annual licenses; 3,744 bought combination annual; and 5,055 purchased dailies. These funds are used for grooming cross-country trails.

During FY 84 a major rehabilitation of the Itasca State Park road system was completed. Wilderness Drive is now completely paved. All construction occurred in late fall and early spring to keep interruptions of the park operation to a minimum.

A very important element of the development program, as recognized in the park management plans, is the need for extensive vegetative and wildlife management. This program has accomplished much over the past six years in restoring the natural prairie and forests in state park boundaries. Resource management has also strengthened wildlife population and fishing opportunities in the parks.

The special Greenview Program of hiring 35 seniors (mostly retired farmers) has been highly successful. They helped maintain and operate the 25 parks that are part of this program.

The Division has worked with volunteers for many years. One of the newest and most successful projects of this type has been the campground host program, which has added to the comfort and enjoyment of campground guests.

An intensive two-day training program offered to all administrative and supervisory personnel resulted in substantial increases in recruitment and utilization of volunteers and interns, and a more effective overall volunteer program.

The gift program, with the new Support-A-Park Program, developed corporate and private gifts to assist the parks and Minnesota youth through the Minnesota Conservation Corps (MCC). This program received gifts of \$49,500 in 1983. A gift catalog is being developed.

As part of the information program funded by the LCMR, a cost-accounting system has been initiated to provide realistic comparisons between various parks within the system. To be effective, the program must continue to reveal trends in operating costs.

The use of concessionaires to operate food services, canoe and boat rental, shuttle services and unique services such as cross-country ski rental, is being continued.

Park Maintenance and Operation

During the Biennium the Division maintained and operated 58 state parks, 17 waysides and six recreational areas under a general appropriation of \$6,814,997 plus \$2,247,857 from dedicated receipts in 1983. In FY 84 the appropriation was \$6,814,997 plus \$3,001,165. The following were added to the system: five new buildings (toilets, shelters, interpretive centers); ten new recreation facilities (trails, picnic and camping areas); and seven support facilities (shop, sewer, water).

The price of vehicle permits for residents is \$10 annually; for two-day, \$3; for out-of-state, \$15; for two-day out-of-state, \$4. Minnesota senior citizens get permits for half price. Receipts from these permit sales, along with camping fees and other park income, were dedicated to an operation and maintenance account of \$3 million. Of this, \$795,200 was spent on the accelerated maintenance program to provide safety, health, resource and facility protection. Although field requests and needs were many times greater than funds available, this funding helped provide a safer and more enjoyable experience for the visitor.

Annual state park attendance has remained close to 6.5 million -- 6,352,125 in 1982 and 6,368,148 in 1983. Winter use has increased and the trend is expected to continue. New state park winter and summer maps were published, and statewide brochures were printed and distributed. More information must be made available to the public.

New park managers received training to aid in the enforcement of park laws and rules. Park managers were brought into quarterly administrative

meetings to participate in the development of policy and in other phases of the Division's activities.

In the fall of 1983, the Division held special training in public relations for the permanent park personnel. This training has shown very good results.

The Division in June 1984 held training sessions in the parks for all field personnel who have contact with the public.

Increased maintenance and operation costs, underfunded salary increases, and budget reductions to cover statewide deficiencies have made it necessary to shorten the primary operating season. Although all parks remain open year around, services are reduced substantially and facilities closed from Labor Day to Memorial Day. In addition, many maintenance projects have been deferred.

Land Acquisition Program

During the Biennium 447.68 acres were acquired. This program is funded by the 1982-83 bonding appropriations. These lands were in six state parks. The lands will be used to enhance scenery and provide added public facilities, such as camping, trails, picnicking and water access. The lands were acquired by gift and purchase.

Visitor Services

Visitor Services in the Minnesota State Park and Recreation System include interpretive and informational services. By promoting public awareness and understanding of the objectives and services of the Minnesota Department of Natural Resources and the Division of Parks and Recreation, Visitor Services annually affects the attitudes and activities of thousands of individuals. Through programs, signs and informational materials, Visitor Services provides direct assistance in the management of state parks, and helps minimize the human impact on fragile or overused areas.

Interpretive programming in state parks increases enthusiasm, enjoyment, understanding and use of the park resources, services and facilities. Opportunities for enriching the visitor's experience are available through interpretive or visitor centers, evening campfire programs, guided hikes and bike tours, film and slide programs, demonstrations, canoe and auto caravans, special guest speakers, tours and informational material on historic, geologic and archaeological sites, and special events and programs for organized groups.

During the Biennium, personal Interpretive Services were available in 34 of the 64 state parks and recreation areas. A new interpretive trail center was opened at Afton State Park. Six- and nine-month interpretive positions at six parks were increased to 12-month, 36-hour positions to accomplish several objectives: to help expand year-around use of parks, to help promote public awareness of park resources and facilities, and to decrease unemployment liability.

Those parks with year-round programs now include Fort Snelling, Whitewater, Sibley, Lake Bemidji, Helmer Myre and Wild River. A nine-month

program exists at Blue Mounds. Twenty-six parks had full-time interpreters during the summer only. Four parks had interpretive or informational services provided by the Historical Society. Park managers or volunteers provided some visitor services in six parks.

During this Biennium the Division has invested in interpretive signs, informational kiosks, self-guided trails, radio programs, newspaper articles, and interpretive exhibits both in parks and in outreach locations to increase public awareness and use and satisfaction with park resources, services and facilities.

A series of special events was initiated, with marked success, to attract new park users through a comprehensive statewide promotion. Self-guided trails also aided the program.

A synchronized slide tape program, "The Minnesota Experience," was developed to promote the use of Minnesota state parks. An official state park song, "Minnesota Melody," was written and used with special public service announcements and advertisements. The Division of Parks and the U.S. Fish and Wildlife Service published a four-color brochure featuring the Minnesota Valley state parks. A publications manual was printed and distributed to parks personnel to aid the production of publications and improve their quality.

The Outdoor Recreation Information Center program is using the computerized data base to more quickly respond to requests for information. Of the 52,200 phone calls to the ORIC, 95 percent have been handled by ORIC personnel without transferring these calls to third parties. This has tremendously increased user satisfaction with information service. Walk-in traffic continues to build.

Overall, more than 1.9 million park visitors came in contact with personal interpretive services in state parks. Outreach visitor services, through publicity, promotion and public information efforts, are estimated to reach an additional 15 to 20 million annually.

During FY 83 and FY 84, a new award-winning statewide brochure was printed with 500,000 copies distributed. New camping reservation brochures were developed, printed and distributed each year. A brochure featuring the state park group camps was written, printed and distributed to promote the use of these facilities. A marketing study recommended directions and priorities for the promotion of the group camps.

The 1983 Legislature funded a special project to increase public visibility of state parks, improve public access to outdoor recreation information and expand cooperation with the other service providers in the tourism industry. By providing the services of an information officer, the Division of Parks and Recreation has accomplished the following: distributed substantially more news releases, held two successful press conferences, developed and continually updated media distribution lists for computerized dissemination of park information, responded to 30 additional service requests and speaking engagements, and updated all SCORP data for the division's computerized system.

Special Issues

The special issues facing the Division of Parks and Recreation include the following:

- * Adequate funding for maintenance and operations.
- * Improve public access to information regarding park facilities, services and resources.
- * Assessing park users' and non-users' satisfaction and expectations regarding state parks.
- * Adequate funding for continuation of the land acquisition program to purchase inholdings from willing sellers.
- * Adequate funds to maintain aging facilities, many of which were built by the Civilian Conservation Corps in the 1930s.
- * Adequate funds to implement new development goals, as stated in approved park management plans and SCORP.
- * Cost-accounting system to improve cost-effectiveness.
- * Training and informing the Division staff as recommended by the special administrative study completed by the Department of Administration.
- * Realigning the Division of Parks and Recreation and the Trails and Waterways Sections into one division as recommended by the 1984 DOA Study.
- * Updating the management plans required by the Outdoor Recreation Act of 1975.

* * *

TRAILS AND WATERWAYS

The goals of the Trails and Waterways Unit are to provide hiking, biking, snowmobiling, skiing and horseback riding opportunities within the state's 9,000-mile recreational trail system; canoe and boating within the 2,500-mile designated river system; and the use of the public waters of the state through the development and maintenance of over 1,100 free access sites.

Overall management of these high-demand recreational programs is vested with a special assistant to the commissioner. Field operations of these programs are the responsibility of the regional administrator. Both are supported by specialized staff. During the Biennium emphasis has been placed on the acquisition of 15 severances, the development of 11 authorized state trails and the acquisition and development of 130 access sites on high-priority public water bodies. Grants-in-aid and working agreements with 200 local units of government, recreationally oriented groups and private contractors provide most of the development and maintenance of these facilities.

During the Biennium the Trails and Waterways Unit, in conjunction with the Division of Parks and Recreation, opened a DNR Outdoor Recreation Information Center to provide the public a "one-stop-one-call" location for obtaining maps, brochures, charts and current information on all DNR recreational facilities, trails and designated rivers.

Minnesota Trails Assistance Program

The DNR has been delegated responsibility (by the Legislature) to administer two cost-sharing trail programs. In 1981 the dedicated snowmobile account was created. Fees from the registration of snowmobiles and the unrefunded gas tax attributable to snowmobile use has been credited to the snowmobile trails account. During the Biennium this account has increased grants to local units of government by approximately 40 percent for the development of 300 miles of connecting link trails and maintenance of 6,500 miles of trails.

In 1983 the Legislature passed the Cross-Country Ski Law, which requires a license to ski on any non-federal public trails which are designated and promoted for cross-country skiing, excluding trails that have not received state acquisition or betterment funds for recreation purposes. This revenue-generating measure is now providing funds to help defray the cost of maintaining 600 miles of grants-in-aid trails developed by local units of government, and nearly 600 miles within DNR management units.

Trail Planning

The Trails Unit is charged with planning all state trails; reviewing all DNR unit plans for their consistency with statewide goals and policies; and providing relevant data to be used in administering the state's grants-in-aid trail programs for snowmobiling and cross-country skiing.

This past Biennium saw final passage of the "Minnesota DNR Trail Plan." This plan will strategically guide the DNR's trail efforts on state trails within DNR recreation units and on grants-in-aid trails. It recommends DNR cooperation with other trail agencies in identifying, planning, developing, and marketing for each user group a collection of long-distance trails that reveals the breadth of Minnesota's resources. In addition, the unit completed the "Interpretive Plan for State Trails."

The master plan for the Root River State Trail was completed and approved during the Biennium. Planning for the Gateway Segment of the Minnesota-Wisconsin Boundary State Trail was initiated. A trail feasibility study for the Wild Indigo Scientific and Natural Area (SNA) was completed and presented at a public hearing.

The unit also initiated a use-monitoring program in 1984 that measured statewide use by snowmobilers and cross-country skiers. Additional reports included an investigation of costs related to providing cross-country ski trails, and an opinion survey of landowners along grants-in-aid snowmobile trails, relative to three-wheel vehicle use. The unit participated in the off-road vehicle use study, and continues to maintain and publish the "Registry of Recreational Trail Miles."

Trails Operations Program

The DNR has the responsibility for acquiring, developing, maintaining and grooming state trails (authorized by the Legislature); DNR trails (those designated by the Commissioner); state forest trails (those within state forest units); and state park trails (those within state parks).

Acquisition

Opposition to state land purchases, difficulty in financing capital spending through bond sales, and escalating land costs have slowed the purchase of lands for recreational trails, but in spite of this, several important acquisitions have been made. The major goal of the acquisition program is to acquire severances and to extend existing trail rights-of-way.

Major acquisitions that were completed included abandoned railroad grades from Moose Lake to Barnum, and one in Faribault that provides a connection from the end of the Sakatah Singing Hills State Trail into town.

A one-mile segment of old railroad right-of-way was purchased at the southern end of the Douglas State Trail. This will connect the trail to the northwest part of Rochester.

Acquisition also continued on stretches of the Taconite State Trail into Grand Rapids and the Tower to International Falls State Trail.

Initiated this past Biennium was the acquisition of a 7.8-mile portion of the abandoned Soo Line railroad from Interstate 35E in St. Paul to Interstate 694 in Oakdale.

Development

Development of trails during the Biennium was accomplished primarily on state trails; there was some rehabilitation of trails in state parks and forests. The major goal of trail development is to complete existing trails and to rehabilitate facilities. The development activities include the completion of the North Shore State Trail for snowmobiling from Duluth to Grand Marais, and the rerouting of 30 miles of trail to alleviate logging conflicts. Also, all but the westerly 20 miles of the Taconite State Trail was completed for snowmobiling, and 40 miles of the Tower to International Falls State Trail were completed.

Maintenance

With the passage of the dedicated snowmobile account and the cross-country ski program, winter maintenance has become less of a problem. When winter grooming equipment has been upgraded, the remaining problems will be solved.

The summertime maintenance of trails, which is financed primarily from the general fund, is becoming less and less adequate each year. The reason for this is that maintenance funding has remained the same, but an additional 138 miles were added to the state trail system in 1983 and 25 miles in 1984; these trails require maintenance.

Water Access

The DNR operates 1,100 water access sites to provide the general public free access to lakes and rivers throughout the state. These sites, averaging two acres in size, may be located in management units, or are management units in themselves. The typical water access site contains a boat-launching ramp, parking lot, entrance road and (in high-use areas) toilets and trash barrels.

There is a Department policy for statewide operation of the water access program. There is also an agreement with the Metropolitan Council and the Minnesota Department of Energy and Economic Development to provide access in the metropolitan area. A special task force for Lake Minnetonka completed its work and submitted a report outlining a method to provide additional and improved access to the lake. Strong emphasis is given to cooperation with other governmental units to establish access.

Minnesota ranks second in the nation in the number of boat licenses, with more than 610,000 registered (one for every seven residents). With the number of boat licenses increasing every year, there is continuing demand for more access to lakes and rivers.

In the process of access acquisition, public input is sought through news releases requesting written comment or through public meetings. Special efforts have been made to publicize the availability of accesses, including publication and distribution of maps for 47 counties, which show access locations, and media campaigns advertising newly purchased and constructed access sites.

Funds available for water access acquisition and improvement totaled \$2 million. Approximately 100 accesses were improved and 30 accesses were acquired during this period.

River Recreation Program

The program provides and maintains river recreation facilities for 19 designated rivers. Facilities include primitive campsites, rest areas, portage trails and access sites along the river. Services include river clean-up, snag removal, maps, informational guides, water level reports and signing of hazards.

During the past Biennium the Pine River was added to the River Recreation System. This addition will provide another 65 miles of river route. New facilities, marking of hazards, and informational materials will be provided for enhanced public use.

In an attempt to determine total recreational use of the Cannon River, the Trails and Waterways Unit and the Section of Fisheries cooperated to conduct a recreational and fisheries study.

Lease agreements were obtained from other governmental units to permit the development of 21 river facilities. Four parcels were purchased to provide new facilities on three river routes. Seven new boat-launching sites were constructed to enhance river boating.

With regard to water safety, three seasonal river crews were added to monitor river conditions and remove obstructions, such as log jams. The number of complaints related to river obstructions declined.

Several trends point to increased use of designated river routes. Watercraft registrations are on the rise, leisure time is increasing, and the desire for water-based recreation opportunities is increasing. These trends, coupled with the emphasis on tourist promotion, will require more intensive management of the river resource. Additional rivers may be designated in attempts to disperse the use.

Future efforts of the River Recreation Program will be directed toward intensified management of designated river routes. Public informational materials will be updated and improved for public distribution. River recreation plans will be developed to assist resource managers in their efforts to provide recreation opportunities and wise management of rivers.

* * *

WATER RESOURCES MANAGEMENT

Areas of Involvement

The Division of Waters is responsible for the administration of five major regulatory programs involving water resources, including:

- * Permits for changes in the course, current or cross-section of protected waters and wetlands.
- * Permits for the appropriation and use of ground and surface waters of the state.
- * Permits and standards for dam safety, involving the construction, reconstruction, maintenance and repair of dams that pose great hazards to public safety and property.
- * Flood plain management activities involving guidance, direction and maintenance of state standards in the development, by local governments, of regulations governing the use and occupancy of flood plain areas under local jurisdiction.
- * Shoreland management activities involving guidance, direction and maintenance of state standards in the development, by local governments, of regulations governing the use and occupancy of shoreland areas under local jurisdiction.

Nearly 70 percent of the time of the Division's 77 permanent full-time employees was spent directly in the administration of those five regulatory programs during the Biennium.

Program Accomplishments

Permits for Changes in Protected Waters

During FY 83 the Division issued or denied 940 permit applications to alter the course, current or cross-section of protected waters. During FY 84 the Division processed 1,239 permit applications. The median time required to act on a permit application is 55 days, though some complex permit applications require much longer for various reasons, including the conduct of public hearings.

The Division during FY 83 received eight demands for public hearings on protected-waters permit decisions. Through negotiation with the affected parties, two of these cases were settled without the need for holding a hearing. The remaining six cases were not resolved through negotiation and resulted in public hearings held before a state hearing examiner. During FY 84 a total of 16 demands were made for public hearings on protected-waters permit decisions. Through an increased effort to resolve these disputes through negotiation, 12 of these cases were settled without a public hearing. The remaining four cases went to public hearing before a state hearing examiner. In addition, the DNR held one public hearing to establish the natural ordinary high-water elevation of Sturgeon Lake.

To increase program efficiency, the Division revised permit rules and developed internal administrative guidelines as follows:

The protected-waters permit rules were amended during FY 83 to deregulate a number of minor activities and create new criteria for mining and drainage activities. Under these rule amendments, permits are no longer required for activities on watercourses that drain less than five square miles and do not cause erosion, sedimentation or flooding problems (as determined by local Soil and Water Conservation districts or county officials).

The development of a comprehensive program operations manual was initiated during FY 84 to clarify permit processing and issuance procedures, with a goal of delegating additional permit authority to Division regional field staff to provide more efficient action on permit applications.

A 1983 law raised the permit application fee from \$15 to \$30 and required the recovery of direct and indirect costs of the protected-waters programs based on appropriate fees. In response to this law, the Division drafted permit fee amendments, including the following provisions:

For the protected-waters permit program, the \$30 permit application fee covers the clerical cost of receiving, recording and processing permit applications. Inspection fees are charged to recover the actual cost of field inspections conducted for permit projects that also require an environmental assessment worksheet or environmental impact statement. Minnesota Statutes 105.44 exempts other protected-waters permit field inspections from inspection fees. Further, projects coming under dam safety rules are subject to separate inspection fee schedules. The proposed additional permit application fee schedule is designed to recover the cost of professional review of protected-waters permit applications, exclusive of the cost associated with field inspections.

The administration of the permit program depends on an accurate inventory and designation of the waters which are legally protected as protected waters under state laws. During the Biennium the Division completed the inventory and hearing process designating the protected waters (see "Investigations and Studies" later in this chapter).

The State Water Bank program is directly related to the protected-waters regulatory program. The DNR has continued to enroll wetlands in the State Water Bank Program. This program is designed to prevent the drainage of wetlands identified in the protected-waters inventory by providing compensation so that wetlands that qualify as protected waters can be preserved. During FY 83 the DNR received 23 applications, made 19 offers of compensation and enrolled 1,165 acres for a cost of \$369,377.50. During FY 84 the DNR received 30 applications, made 22 offers of compensation and enrolled 482 acres at a cost of \$218,140.47.

Permits for Appropriation and Use of Waters

The Division in FY 83 received 154 permit applications for the appropriation and use of water. During FY 84 the Division received 331 permit applications. There presently are 5,790 action permits for appropriation and use of water. Another 700 requests, for modification or termination of existing permits, were received and acted on during the Biennium. Because of

increases in permit fees and pumping report fees, some proprietors have chosen to cease withdrawals, and in other cases sought changes to reduce the amount of water used.

Major emphasis was placed on reducing the number of preexisting unpermitted appropriations located within municipalities that were exempt from permits before 1973. Before the Biennium 196 municipalities and more than 200 industrial and commercial water appropriators were unpermitted. At the end of FY 84 there were only 50 municipalities and fewer than 20 industrial and commercial users remaining without permits. Efforts are continuing to bring them into compliance with the 1973 law.

The expanding water appropriation and use within Minnesota, especially for agricultural uses for irrigation and wild rice, resulted in considerable time spent in dealing with water-use conflicts involving protected flows in streams and problems involving interference between wells, primarily those of domestic users and large appropriators. During the Biennium the Division investigated and acted on more than 25 well-interference disputes.

The most notable resolution of an in-stream flow dispute during the Biennium involved the conflicting demands for water for wild rice growing in the Clearwater River area. This dispute (discussed in "Investigations and Studies") was resolved after considerable study and negotiation of an acceptable plan providing for water use for wild rice growers while still maintaining reasonable protected flows in the river for the public.

Development of plans for protected flows on parts of the Mississippi and Otter Tail rivers was initiated in FY 84.

Dam Safety

The dam safety program was established in 1978 to ensure that dams in the state be safely designed, constructed, operated and maintained. Activities conducted under the program during the Biennium included the following:

Permits: Plans for the construction of 30 new dams and 42 modifications to existing dams were reviewed for adequacy, resulting in the processing of 72 permits.

Inspections: A total of 130 dam safety inspections were conducted during the Biennium as a part of permit review, dam construction or repair, preparation of emergency plans, evaluation of specific problems at dams and to provide periodic inspections required of existing dams by state dam safety rules. Priority for inspections was given to high-hazard dams, dams under construction using state funds, and those with known safety deficiencies.

Inventory: The inventory of dams in the state is continuously updated. The inventory currently lists 889 dams, 37 of which are high-hazard dams.

Grant Programs: The program includes administration of funds appropriated by the Legislature for correcting safety deficiencies at publicly owned dams. During the Biennium, dam safety projects were completed or in progress at 18 dams under this program.

Assistance: In addition to the grant program, technical assistance was provided during the Biennium to approximately 25 dam owners, designers and operators.

Hydropower: Dam safety program responsibilities include assistance in the coordination of hydropower activities and review of hydropower development plans during the permit process. During the Biennium, hydropower projects at Rapidan, Lake Byllesby, St. Cloud, Granite Falls, Sartell, Lock and Dam #2 and Kettle River were coordinated under the program. During the last half of FY 84 (extending into FY 85) the dam safety unit provided the bulk of the funding for and administered, in cooperation with the Minnesota Department of Energy and Economic Development, a contract for consulting services intended to coordinate hydropower development with affected economic and environmental interests.

Fees: Fees are collected for inspection of privately owned dams, including initial inspections of new dams or periodic inspection of existing dams. During the Biennium about \$60,000 in fees was collected for these inspections.

Federal Programs: The Federal Emergency Management Agency, in cooperation with the dam safety staff, provided \$37,000 in funding for these projects, which were begun in FY 84: "Guidelines for Emergency Plans for Dam Failures"; "Manual for Dam Owners"; and a dam safety seminar geared to dam owners.

Flood Plain Management Activities

During the Biennium efforts were continued to assist local governments in the maintenance of a continuing integrated flood plain management program stressing nonstructural damage reduction measures, such as land-use regulations, floodproofing structures, flood forecasting and warning systems and flood insurance augmented with structural measures. During the Biennium 30 additional communities adopted flood plain management ordinances, bringing the state total to 275 locally adopted state-approved ordinances. A total of 460 local governments now are eligible for flood insurance and will remain so, provided local flood plain ordinances and resolutions are properly enforced.

The primary emphasis has been on assisting local governments that rely heavily on the Division for the administration and enforcement of ordinances. Other activities included in-depth evaluations of ordinances for 70 communities to ensure that they were being properly administered and enforced. There now are 75 communities sponsoring federally supported studies of flood control, for which the Division provides guidance regarding water policies and laws.

Although the program emphasizes stream flooding, flooding increased around lakes with limited outlets. Notable examples included Pulaski, Prior, Big Marine and Big Carnelian lakes. Considerable time was spent during the Biennium in discussing solutions to lake flooding problems and attempting to resolve problems.

Shoreland Management Activities

The primary accomplishments of the shoreland management program during the Biennium involved community administrative and technical assistance, municipal ordinance adoption, planned unit development and cluster analyses, and the initiation of rule revisions. Shoreland ordinances were adopted by 25 additional municipalities, bringing the statewide total to 89 municipalities and 85 counties.

Six reports were published during the Biennium as an outgrowth of the shoreland program evaluation. The reports discuss program effectiveness; trends in shoreland development; shoreland resident preferences and opinions regarding lake management and use; and recommendations for shoreland management in the future to maintain and enhance the environmental and economic value of lake and river shorelands.

Wild and Scenic Rivers Management

The Division's primary focus is assistance to local governments in the administration and enforcement of local wild and scenic rivers ordinances, standards, program monitoring and enforcement, and program education and training. The Wild and Scenic Rivers Program in Minnesota includes the Cannon River; North Fork of the Crow River; Upper Minnesota; portions of the Mississippi River; Rum River; Kettle River and the St. Croix National Scenic Riverway.

During the Biennium eight additional communities adopted wild and scenic rivers ordinances; 45 of 55 communities now have state-approved ordinances. In addition, the Division has field monitored half of the 1,000 miles of river in the program. This monitoring has led to increased coordination with local government and enhanced river management practices. The Division acted on 16 requests for land-use ordinance certification, approving 15 and denying one.

The Division published a river management booklet for workshops with local government. The Division's "Wild and Scenic Rivers Operations" manual was completed and distributed. The manual delineates responsibilities and authority for the Division's wild and scenic rivers activities.

Division of Waters Data Management Program

Data Management Activities

The Division of Waters has taken great strides in recent years to upgrade its record keeping and resource analysis by computerizing the water resources information it collects. The major activities over the past two years involve the development of a water-use data base (in conjunction with the U.S. Geological Survey) and the development of a Statewide Water Data Network containing information on water resources permits issued by the Division.

The water-use data base contains information about water appropriators, such as the source of the water, the amount of water that is used, well construction, and the location of the water intake. This information can be used to analyze conflicts and new permit applications and to evaluate the availability of and the demand for water.

The Statewide Water Data Network is a tool for tracking and analyzing protected-waters permits. Information on this data system includes the body of water affected, the type of activity that is proposed, the location of the project, the amount of time needed to process the permit application, and more. This data system will help monitor the processing of permit applications and analyze the effect of permits on a body of water.

Numerous other data bases have also been under development, including: the observation well data base, which contains information on water levels and well construction; the Statewide Water Information (SWIM) lakes data base, which contains information on lakeshore development, permits, fish stocking, fish population and physical characteristics; the master permit index, which will be replaced by the Statewide Water Data Network; numerous climatology data bases containing information on temperature and precipitation; computerized models for evaluating groundwater availability, stream hydrology, flood elevations and other information needed for water resources management.

Investigations and Studies

Protected-Waters and Wetlands Inventory

During FY 83 the DNR completed a statewide inventory of Minnesota's protected waters and wetlands. The inventory involved extensive public participation and identified 4.9 million acres of protected lakes and marshes. There are 11,842 protected lakes, 10,029 protected wetlands, and 6,564 protected rivers and streams included in the inventory. During FY 84 the DNR began publication and distribution of the final inventory maps. Maps of 29 counties have been published. With the exception of a few unresolved court appeals, the remaining county inventory maps should be published during FY 85.

Surface Water Monitoring and Investigations

During this report period the Division received from all DNR regions 214 requisitions for Hydrographic Services. These requests resulted in Natural Ordinary High Water investigations, documentation of topographic features at sites of unauthorized excavation or filling, and investigation of water-level controversies pertaining to protected waters throughout the state. Field surveys, hydrologic and hydraulic studies, drawings and reports were completed in this regard. Division personnel provided expert testimony at public hearings and meetings as part of these requisitions.

In addition to the formal requisitions, the Division made telephone and letter inquiries requesting lake and stream information and benchmark data.

A total of 382 inspections were conducted at state-owned dams. These inspections included data collection, adjustment, preventative maintenance and minor repairs to the structures. Contracts for reconstruction of the Moses Lake Dam in Douglas County and the Minnewawa Lake Dam in Aitkin County were let at a total cost of \$30,000.

The Division also continued to operate a statewide lake-level monitoring program. This activity includes establishing gaging stations, providing precise "leveling to zero" (equating gage readings to sea level datum) gages, obtaining volunteer observers, and the securing and recording of stage records

at 54 temporary and 53 permanent stations. In addition, data from stations monitored by other agencies were incorporated into the lake-level data system.

Interest in a summary lakes data base, consisting of technical data from the Division's lake files, resulted in development of a coded summary sheet and a sample data inventory. Files of 50 key lakes in Region 2 were researched and summary sheets completed.

A major issue that has developed recently is the need for protected flow levels on streams to protect in-stream needs and to provide water for higher-priority downstream users. The best example of this situation occurred on the Clearwater River in northwestern Minnesota where there has been a tremendous increase in wild rice irrigation. This has resulted in seriously depleted streamflows when the irrigators flood their paddies. To protect streamflows and downstream users, appropriation permits for persons using the Clearwater River were modified. Additional efforts are being undertaken to better identify in-stream flow needs and to identify protected flow levels where necessary.

Groundwater Monitoring and Investigations

During the Biennium the Division developed a comprehensive Groundwater Investigation Plan which identifies intended accomplishments for better quantifying our groundwater resources over the next ten years.

The groundwater staff also responded to 43 service requests, which included aquifer tests, well-interference investigations, assistance on well construction and others.

In FY 84 the fees charged for appropriation permits and the fees associated with the annual pumping reports were increased to improve the monitoring and analysis of water appropriations. These fees yielded an increased appropriation for groundwater monitoring. Observation wells in the Soil and Water Conservation District (SWCD) network went from 237 in FY 83 to 276 in FY 84 and will number 326 wells in FY 85. (This does not include more than 40 wells from the U.S. Geological Survey Network that will be included in the SWCD Network in 1985).

Climatological Investigations and Studies

The state Climatology Office continued to collect and disseminate information on precipitation and temperature from official and volunteer reporting networks. Several summary reports are now available.

Major projects undertaken included the climatological analysis for proposed peat development projects, Clearwater River runoff analysis, snow depth and duration analysis and updating the 30-year normals for temperature and precipitation. New statistical analyses contributed to the understanding of climatic cycles affecting the state and the impacts on lake levels.

The office also continued the analysis of severe storms, flash floods and crop forecasts, which are widely disseminated to interested parties throughout the state.

Water-Quality Investigations

Water-quality sampling was continued annually in selected wells in eight counties in central Minnesota, and a study was begun to characterize groundwater quality in the Anoka Sand Plain aquifer. Funding was provided through the appropriation in anticipation of fee receipts for water use. These projects are funded 50 percent by the U.S. Geological Survey, which does the work.

U.S. Geological Survey/DNR Cooperative Investigations

The U.S. Geological Survey and the DNR continued a number of monitoring projects and regional studies. In terms of surface water, continuous recording gages were maintained at 26 different sites as well as numerous high-flow and low-flow readings. In terms of groundwater, 230 observation wells were utilized for water-level measurements.

Eight regional studies were also continued or started during the Biennium. These included:

- * Twin Cities groundwater model
- * Upper Pomme de Terre/Chippewa study
- * Development of geophysics as a tool for groundwater investigations
- * Compilation of sediment data for Minnesota streams
- * Water-use data system development
- * Groundwater supplies in Pine, Carlton and Kanabec counties
- * Ground and surface water relationships in the Big Marine Lake area, Washington County
- * Groundwater quality in Hubbard, Wadena, Morrison and eastern Otter Tail counties.

Cooperative Efforts and Special Studies

Interagency Coordination

The Division of Waters participated in developing cooperative agreements with the St. Paul District Corps of Engineers and the Minnesota Pollution Control Agency to reduce duplication of the water resources permit programs of each of the three agencies. These agreements should reduce the burden on persons applying for water resources permits.

The Division of Waters also has secured a cooperative agreement with the state of Wisconsin for the coordinated management of our border waters.

Throughout the last two years the Division has continued to be the primary contact for federal public works water resources projects conducted by the U.S. Corps of Engineers and other agencies.

While numerous studies have been initiated for flood control, navigation, small-craft navigation and erosion control, no federal money has been available to complete many of them. No major federal water resources funding bill has been passed; so only small, low-cost projects have been constructed. It appears that this trend will continue because of the large federal deficit and potential increases in local cost-sharing requirements. The Corps has only recently exhibited interest in lake flooding problems and has become involved, with our support, in Lake Pulaski.

Numerous special projects were coordinated by Division staff. Some of these included the "Upper Mississippi River Master Plan"; the "Voyaguers National Park Black Bay Management Plan"; the "Corps of Engineers Land Management Plan" for lands along the Mississippi River; and the "Land Suitability Study of DNR Administered Lands."

The DNR is responsible for advising county ditch authorities and watershed districts on the adequacy of engineers' reports for project proposals.

The DNR is also responsible for advisory reports on the establishment of lake improvement districts. Because of the problem of rising lake levels, interest in lake improvement districts has increased significantly.

A high degree of coordination has also been maintained with the Soil and Water Conservation Districts and the Soil and Water Conservation Board. The districts and the board are essential to the observation-well network and the precipitation data network sponsored by the Division. The SWCDs also have a major role in providing comments on protected-waters permit applications.

The Division competed with a number of organizations in the development of information and education materials on groundwater -- including news articles, professional papers and radio and telephone public service announcements. The Division proposed to the LCMR a water allocation and management plan to address the availability, distribution and use of ground and surface water and future management strategies for economic development in an environmentally safe manner (see "Future Issues and Initiatives").

Future Issues and Initiatives

Although much progress was made during the Biennium, a number of emerging issues, problems and concerns remain to be addressed during the 1984-86 Biennium. A major problem is that the Division needs more people and money to effectively administer the many water resources management programs required by Minnesota laws.

Protected-Waters Permits Tasks

Tasks remaining for FY 85-87 include the following: further revisions of the protected-waters permit rules; further decentralization of permit administration authority to regional offices; adjustment of fees to recover the full cost of professional review of protected-waters permits; selection of wetlands for inclusion or renewal in the Water Bank program; and the preparation of commentary for legislative review of the State Drainage Code.

There now is no requirement that the DNR be notified in advance of proposed ditch repairs by the drainage authority, even if a wildlife management area or a wetland in the Water Bank program will be affected or destroyed. Also, there is no comprehensive ongoing effort to document the original depth of ditch construction through wetlands adjacent to ditch systems in which DNR has paid for property interests, including about 1,200 WMAs.

Water Appropriation Permit Issues

Several major issues related to water appropriations are emerging and need to be addressed:

* As a result of recent U.S. Supreme Court decisions, Minnesota may not be able to limit out-of-state diversions unless it can be demonstrated that the water is or will be needed for use within the state. Thus, Minnesota needs to determine how much water may be needed for future uses in various regions of the state, not only to improve day-to-day allocation decisions, but also so that possible trade-offs may be considered within the state as an alternative to out-of-state diversions that are almost certain to be proposed.

* The recent sale of Missouri River water by South Dakota is lending new urgency to the realization that water constitutes an important economic resource. The concept of water allocation also entails profound social and environmental consequences. The DNR must study the social, economic and environmental value of water.

Dam Safety Issues

Efforts during FY 86-87 will be directed to processing dam safety permits, inspecting and correcting safety deficiencies at existing dams, developing adequate operation and maintenance plans at dams and implementing emergency plans at hazardous dams. The review of engineering plans for new dams is a continual job of the dam safety unit.

Flood Plain Management Issues

The state flood plain management program has substantially slowed the creation of new flood hazards in Minnesota since 1969. However, additional state efforts are needed to reduce flood damage and the potential for loss of life associated with more than 17,000 pre-existing urban and rural structures located in Minnesota's flood plain. Also necessary is a program of state cost sharing for the development and implementation of community initiatives to reduce flood damage. Techniques to be incorporated into local plans include flood warning systems (pilot at Whitewater State Park); signing of flood plain areas (pilot at Crookston); flood proofing in public buildings and technical advice on privately owned structures (done at Rochester); floodwater impoundments (LCMR pilot in Red River Valley); detailed inundation mapping; assessment of damage potential (Pulaski Lake), and snagging and clearing of debris, acquisition and relocation of flood-prone structures, and other damage reduction initiatives. A program incorporating these features has been proposed to the Legislature.

Shoreland Management Issues

During the past five years new innovations in shoreland development (such as time sharing, condominiums, lease-back options, cooperatives, condo mobile-home parks and campgrounds) demonstrate the need for more comprehensive lake management. Without aggressive efforts to cope with these new trends, the past successes of the shoreland management program could be impaired.

There is a need to look at lakes as unique management units to integrate management for fish, wildlife, land use, surface water and groundwater. Local governments and lake associations have expressed genuine concern for the lakes and a willingness to undertake activities, such as quality and quantity monitoring, surface water controls and other measures. However, they need guidance and technical assistance to ensure that their efforts are not in vain. This guidance could take the form of lake-watershed biographies, which would explain the physical setting of the lake and the management history and needs of the resource. The next step would be the development of lake-by-lake management plans for problem lakes around the state.

Wild and Scenic Rivers Management Issues

The emphasis for the future is in continued community assistance; evaluation of management plan effectiveness, river by river; river management monitoring; broadening river management options beyond wild and scenic rivers; and conversion of the two LCMR funded hydrologists to general budget positions to accomplish these efforts.

Data Management Issues

A need remains to computerize additional water resources information and to make it more accessible to users. Four major needs have been identified: computerize the Protected-Waters Inventory and digitize the boundaries of these water bodies; improve the River Kilometer Index System to make it more useable with other statewide land and water data bases; computerize hydrologic and hydraulic information for major lakes; and develop standardized groundwater quantity and quality data bases. The LCMR has given preliminary approval to develop the groundwater data bases.

Protected-Waters and Wetlands Inventory Issues

Issues and problems of protected waters and wetlands that must be addressed during FY 86-87 include the preparation and publication of a new atlas of Minnesota's protected waters, to replace the out-of-print Bulletin 25, which was produced in 1968; and the digitization of the comprehensive data gathered during the protected-waters inventory, so that this information can be used with other statewide information systems.

Surface-Water Investigation Issues

A major problem is the need to establish protected flow levels for Minnesota streams as demands for water appropriation and hydropower increase. Protected flow levels must be determined and set to preserve fish and wildlife habitat, water quality, recreational and aesthetic values, and to reserve water for downstream higher-priority appropriators.

Groundwater Investigation Issues

The Division must increase its knowledge of the quantity and quality of the state's groundwater resources. The Division has recently completed a comprehensive action plan covering groundwater investigation needs for the next 10 years. Program costs will be significant but will benefit long-term economic development of the state.

U.S. Geological Survey/DNR Cooperative Investigation Issues

Budget reductions over the last several years have steadily reduced the USGS-DNR cooperative investigation program. The cooperative program is funded 50 percent by state and local sources and 50 percent by the USGS. These investigations provide baseline quantitative information on water availability and quality. For the Biennium the cooperative program has been funded at a level of \$200,000 annually. Previous to this the program had been funded at a level of about \$350,000 per year. This massive reduction has severely impaired our capability to conduct detailed investigations and collect basic water quality and quantity information. The clientele served has increasingly expressed support for restoration of these basic hydrogeological services.

Interagency Coordination Issues

A number of steps have already been taken to improve coordination among local, state and federal agencies. Additional improvements are needed, however, and these include: additional coordination with Pollution Control Agency in areas other than water resources permits; more and earlier involvement in Corps of Engineers small projects; additional sharing of groundwater quantity and quality data and other types of water resources information; and additional assistance for local government units becoming involved in water resources planning and management.

* * *

REGIONAL ADMINISTRATION

Regional Administration is the key element of the Department's field operations throughout the state. For administrative purposes, there are six geographic regions, their headquarters in Bemidji, Grand Rapids, Brainerd, New Ulm, Rochester and St. Paul.

By decentralizing services to the public and its employees, the Department has been able to respond to environmental concerns, resource management crises and individual needs from a regional perspective that would not otherwise be possible. Regional administrators manage the people who manage natural resources and make it possible for resource managers to administer programs rather than paperwork. They serve as liaisons between the Department and county government, township boards and local municipalities. They represent the Commissioner of Natural Resources at public functions and serve as spokespersons for DNR programs and policies.

Responsible for first-line supervision and management at the field level, regional administrators insure that decisions are made on an interdisciplinary basis. For example, consideration must be given to both wildlife and forestry concerns before specific management can be recommended.

Regional administrators are directly responsible for management and supervision of the access programs, as well as other trails and waterways activities. Statewide, considerable gains have been made this Biennium in the acquisition, development, and improvement of public boat launch access sites to lakes and rivers.

Business management activities include budgeting, bill paying, purchasing supplies, implementing union contracts, and processing personnel documents and transactions at the regional level. Field services responsibilities include the purchase of major pieces of equipment, inspection and maintenance of department-owned facilities, consolidation of buildings where possible, repair of vehicles, and inventorying of supplies and equipment. Engineering services and land-related activities are also coordinated by regional administrators.

Public information and educational efforts are also important to regional administration. With continued state budget cuts, there is an increasing need to keep the public informed of DNR programs, facilities and policies. Public information services will be even more important as natural resource problems and programs become more complex. An educated citizenry is the best support for sound management.

During the Biennium regional administrators and the overall Regional Administration Program have also been involved in a variety of other activities, some of which are included here.

Protected Waters

Protected waters inventory hearings have been completed for almost all of Minnesota's 87 counties.

Indian Reservations

Regional administrators, working with the community liaison officer, have been strongly involved in working with the Indian reservations in Minnesota.

Special Studies and Plans

- * Lake Minnetonka Task Force
- * Implementation Plan for the Department of Administration's study of DNR's regional organization
- * Feasibility study of seasonal labor pools
- * Harbor Plan for St. Louis River and Superior Harbor
- * Statewide equipment study
- * Parks residence study
- * Ditch assessments
- * Field Services manual
- * Interdisciplinary law enforcement study
- * Lake suitability study
- * Park management plans
- * Forestry's unit management plans

Other Interagency and Interdisciplinary Activities

- * Metro Water Access Task Force
- * Land exchanges
- * Annual Forestry-Wildlife coordination meetings
- * Revision of residence rent agreements
- * 75th Anniversary of Quetico-Superior Forest
- * Liaison work on a variety of issues with Voyageurs National Park and the Iron Range Resource and Rehabilitation Board
- * Taconite Trail routing
- * Moose River Water Management Unit
- * Zipple Bay channel and harbor
- * Minn-Kota Power Line
- * Land classification
- * Bulldog Creek watershed
- * Employee training
- * Mississippi Headwaters Board
- * Aggregate Resources Advisory Committee

Public Information Meetings and Hearings

- * Acquisition and development of public accesses
- * Special fishing regulations
- * Designation of waterfowl refuges
- * Designation of game and fish management lakes
- * Planning for state trails

It should also be noted that the importance of the Department's Regional Administration was reaffirmed during the Biennium by a Department of Administration study of the DNR's regional structure. The report stated that "the current regional structure enhances efficient delivery of support services to field operations, facilitates coordination across operating divisions, and improves public responsiveness." The study team also noted

that they "were impressed by the commitment of staff to their jobs and to managing the state's natural resource."

In addition to reaffirming the importance of the Department's six Regional Administration units, the study recommended that an additional 15 regional staff positions be created to further improve the provision of business office, land administration, and information and education services for natural resource and recreation management programs.

* * *

ENFORCEMENT

Conservation officers of the Division of Enforcement protect public lands, wildlife and other resources by enforcing natural resources laws, rules, regulations and Commissioner's orders.

Enforcement is accomplished by patrol with modern equipment and by covert operations. All enforcement officers are Minnesota-licensed police officers. They investigate complaints, issue citations, prepare cases and testify as witnesses. Officers train youths in snowmobile and firearms safety. Officers are required to participate in continuing training programs to maintain a state license, and to keep abreast of major changes and new enforcement techniques.

The Division of Enforcement also administers grants to counties for assistance in enforcement during smelt season on the North Shore of Lake Superior, and boat and water safety grants to county sheriffs.

The Division comprises the Arrests and Confiscations, Safety Training, Special Investigations, and General Enforcement units.

Arrests and Confiscations

The Arrests and Confiscations Unit is responsible for the record keeping of all arrests and confiscations and the sale of all perishable items. This unit holds annual sales of all furs, firearms, traps and miscellaneous equipment confiscated during the year.

Receipts for items sold in 1983 and 1984 were as follows:

<u>Items:</u>	<u>1983</u>	<u>1984</u>
Traps	0	\$1,064.50
Furs	\$ 7,753.25	Sold in fields as confiscated
Guns	\$20,676.20	\$26,929.60

The following is the 1982-83 summary for all other confiscations:

<u>DEER</u>	<u>1982</u>	<u>1983</u>
Car Killed	11,471	12,344
Illegally Taken, Shined or Poached	815	627
Killed by Dogs	270	89
Diseased or Crippled	331	277
Taken Doing Damage	4	3
Special Permit	166	70
Miscellaneous	126	110
Total Reported Deer Kills	<u>13,183</u>	<u>13,520</u>

<u>MOOSE</u>	<u>1982</u>	<u>1983</u>
Car Killed	65	63
Illegally Taken, Shined or Poached	12	29
Diseased or Crippled	33	27
Taken Doing Damage	4	4
Miscellaneous	6	22
Total Reported Moose Kills	<u>120</u>	<u>145</u>
<u>BEAR</u>	<u>1982</u>	<u>1983</u>
Car Killed	30	56
Illegally Taken, Shined or Poached	28	22
Taken Doing Damage	112	185
Diseased or Crippled	2	4
Miscellaneous	3	8
Total Reported Bear Kills	<u>175</u>	<u>275</u>
<u>ELK</u>	<u>1982</u>	<u>1983</u>
Illegally Taken, Shined, or Poached	1	0
Total Reported Elk Kills	<u>1</u>	<u>0</u>

Safety Training

During the Biennium there were 18,317 youths certified in firearms in 1983 and an estimated 19,550 in 1984. A total of 3,546 youths were certified for snowmobile operation in 1983 and an estimated 3,300 in 1984.

It is anticipated that there will be an even greater number of youths trained in firearms during the next Biennium, since the 1980 Legislature changed the law to permit the use of handguns for taking small and big game. This will necessitate increased youth training in handguns.

To date, more than 590,000 youths have been trained in firearms and 203,500 in snowmobile safety since the programs were initiated.

There are 4,096 firearm safety instructors qualified and certified to instruct the youth of Minnesota. This number probably will remain constant.

These instructors represent a 100 percent volunteer corps and are to be commended for a successful program that has been a model for many other states.

Special Investigations Unit

This unit was developed to conduct and coordinate investigations involving the commercialization of game, fish, fur, minnows and other natural resources. Its covert operations are an important tool to supplement enforcement efforts of uniformed officers. The unit also trains officers in undercover techniques relating to illegal taking, transporting, sale and purchase of wildlife and other natural products.

The unit cooperates with the U.S. Fish and Wildlife Service and State investigative agencies regarding the commercialization and illegal interstate transportation of game and fish. Special investigators are under the immediate supervision of the Director of Enforcement.

The Special Investigations Unit is also charged with the enforcement responsibility under the new and highly effective Turn In Poachers (TIP) program. The TIP program guarantees anonymity to citizens who phone in (using a special DNR toll-free number) and provide information on violators of game laws. Cash awards are offered to those whose information leads to an arrest.

Funds for the program are provided by TIP, Inc., a private, nonprofit organization of people concerned about wildlife. Membership in the organization includes sportsmen's clubs, corporations and other organizations and groups, as well as concerned individuals. TIP has its own board of directors selected from the statewide membership. Money is raised through membership dues, fund-raising activities and tax-deductible donations.

The following is a summary of TIP activity for 1983 and through October 1984.

	<u>1983</u>	<u>1984</u> <u>(Jan.-Oct.)</u>	<u>Total</u>
Total Calls	1,085	800	1,885
Calls Referred to Field Officers	338	253	581
Arrests Made by Officers	278	205	483
Rewards Paid	115	67	182
Amount of Money Paid Out	\$24,175	\$12,155	\$36,330

Although \$36,330 in awards has been paid out to TIPsters since September, 1981, about two-thirds of the callers refused awards. Most of them were men and women who were concerned about Minnesota's fish and wildlife resources and welcomed the opportunity to report wild game violations -- anonymously.

In the 1980-82 Biennium, 2,466 calls were received and 282 arrests were made. In this Biennium the calls decreased to 1,885 but arrests increased to 581. This indicates that the persons furnishing the tips are providing more reliable information.

General Enforcement

The General Enforcement Unit administers the basic conservation officer program, including law enforcement, safety training, litter and pollution control, waters problems, wild rice regulations, protection of public lands, state parks, state timber and all other responsibilities delegated by the Commissioner.

The following convictions were recorded during the Biennium:

<u>Violation</u>	<u>Convictions</u>	
	<u>1982</u>	<u>1983</u>
Fishing	4,408	4,034
Trapping	149	146
Game Farm	2	4
Fur Dealers	3	0
Littering and Polluting	175	133
Change Cross Section of Lakes or Streams . .	36	40
Trespass on Agricultural or Posted Land . .	41	74
Wild Rice	64	27
State Park	196	246
Forestry	1	12
Resist, Hinder Conservation Officer	18	14
Hunting	1,760	1,596
Uncased or Unstrung Weapons	991	1,189
Snowmobile	722	730
Watercraft	1,513	1,384
Miscellaneous	235	146
Total Convictions	<u>10,314</u>	<u>9,775</u>
Juvenile Court Cases	41	102
Dismissed, Not Guilty	249	261
Total Arrests	<u>10,604</u>	<u>10,138</u>
Adult Conviction Rate	97.3%	96.4%

Road Checks

Recent Supreme Court decisions have liberalized inspection of motor vehicles and their contents. This, in turn, makes road checks a more feasible method of controlling poaching.

A system of road checks to determine illegal activities, success ratios and potential harvests has been initiated. These road checks will not interfere with the normal flow of traffic and will be undertaken with the assistance of the sheriff's departments, Highway Patrol, and with the knowledge and consent of the county attorneys.

The data from these checks will be analyzed by a Department statistician, who will then estimate the illegal take. These checks will identify problem areas so that special work parties can be assigned to these areas. It is anticipated that data from these checks will be used for corrective legislation or more restrictions through Commissioner's Orders.

The Division of Enforcement believes that this type of check will improve the quality of the hunt for honest sportsmen.

* * *

OFFICE OF PLANNING

The Office of Planning provides resource policy development, strategic planning, environmental impact analysis, resource data management and analysis, environmental monitoring and management analysis to the Commissioner's office, divisions and service bureaus.

During the Biennium the Office of Planning was involved in several principal activities which are examined in the following sub-sections:

Environmental Review

The Office of Planning reviews and assesses public and private development projects. This review is required by the state's environmental review program. The Department also must review projects that fall under the National Environmental Policy Act. This environmental review process incorporates the concerns of all the natural resource disciplines into one departmental response. Through this process DNR helps minimize adverse impacts to the environment associated with many development projects and does so in a constructive and timely manner.

During the Biennium nearly 400 federal, state, local and private projects and plans were reviewed, including 173 environmental documents, 81 highway projects, 14 projects and plans of federal agencies, 29 DNR management plans, 32 wastewater treatment plans, 38 utility company plans and 10 hydropower projects.

Other special studies and programs requiring considerable staff leadership and involvement were the School Trust Land Management Report; the Minnesota-Ontario Boundary Waters Fisheries Study; legislative work involving Superfund, water management planning and agricultural preservation; and providing DNR staff involvement in the waste management activities of the Minnesota Waste Management Board and the U.S. Department of Energy (nuclear waste).

Policy Development and Management Analysis

Policy development and management analysis began as a project of the Legislative Commission on Minnesota Resources. It proved valuable to the Department and was converted to general funding in 1983.

The program provides staff skilled in policy development, strategic planning and organizational management. This staff has directed policy on management of outdoor recreation units, river management, departmental enforcement efforts and the forestry-wildlife coordination document.

Work is accomplished through task groups made up of representatives from the operating divisions (both field and central office) with section staff aiding the work of the group. When policy is implemented, the staff monitors the effectiveness of the effort and makes revisions where they are appropriate.

Natural Resource Data Systems

The Natural Resource Data System unit collects and interprets natural resource information, maintains the State Outdoor Recreation Plan and performs special studies. The system's statewide data base is linked to the Land Management Information Center in the State Planning Agency. The staff helps design statistically reliable and valid measures of the quantity, quality and use of natural resources and develops policy alternatives from the information. The unit is responsible for establishing statewide biennial recreation acquisition and development objectives and policies that guide the administration of Land and Water Conservation grants and LCMR recreation grants to local units of government. The staff also provides managers with better information on the type, amount, distribution and use of tourism-recreation resources so that specific management policies and acquisition and development priorities can be developed with confidence.

Recent accomplishments include the following:

- * The development of new basic data, which shows that greater emphasis should be placed on trails and canoe routes and on the protection and enhancement of hunting and fishing resources.
- * The development of Minnesota's only operational computerized recreation and travel information system, which provides information to persons who contact the DNR.
- * Studies of public use on the Luce Line and Sakata Singing Hills trails and of public use on major lakes in the Metropolitan area.
- * Research for the off-road vehicle study and the tourism and recreation component of the Minnesota-Ontario Fisheries Atlas.

The unit provided analytical support to the Department's assessment of the suitability of public lands; worked with the Office of Tourism on the production of standard tourism brochures, such as Minnesota's "Winter Guide"; chaired the new Management Information Systems Technical Committee; and coordinated the standardization of the fisheries creel census so that data gathered is comparable between primary fishing lakes, is useful to the other DNR disciplines and is more readily available. The unit also prepared the 1985 Statewide Comprehensive Outdoor Recreation Plan.

Natural Resources Planning

The Natural Resources Planning Section is responsible for coordinating the Department's land classification program. In addition, the section is responsible for three LCMR projects:

River Planning: The river planning program has continued to effect management plans on six designated Wild and Scenic Rivers. These plans manage and protect rivers and adjacent lands through locally administered zoning ordinances, recreation management and development and limited land acquisition to protect unique parcels of natural river frontage (scenic easements). Personnel from this program have also participated in an evaluation of the Department's river management policy; administered a grant to the Mississippi

Headwaters Board; drafted management plans for the Crow River and resource analysis for the Sunrise River; and supplied staff support to the Metro Rivers Study Committee. Alternatives to state mandated management are a key element in each plan.

Park Planning: During FY 83, management plans for 10 state parks were initiated. These plans include collection and analysis of information on natural resources, present and proposed park development, and projected use. The planning process includes a comprehensive public participation process. By the end of the FY 84-85 Biennium, initial plans for all major state parks will be completed.

Long Range Plan for DNR-Administered Land: This LCMR program, also known as the "Suitability Project," examines the state natural resource lands for their value in meeting diverse management objectives. All available information, including the knowledge of representatives of each discipline, is used. An interim report was submitted to LCMR; so was a special report on surplus lands.

The Section of Natural Resources Planning also serves as liaison with the Office of Tourism and staff to the Department's Outdoor Recreation Coordinating Committee. The section also coordinates DNR programs with LCMR.

* * *

INFORMATION AND EDUCATION

The overall responsibility of the Bureau of Information and Education is to disseminate information regarding the Department of Natural Resources (DNR) policies, management plans, programs, activities and services. The bureau's responsibility includes coordinating the legislatively mandated Boat and Water Safety program.

The Bureau seeks, through informational and educational programs, to encourage citizen participation in the early stages of natural resources management planning. It conveys information on the diverse outdoor recreational opportunities available on DNR managed lands. Bureau clientele include sport, professional and youth groups, teachers, instructors of safety programs, other units of the DNR, and appropriate state departments. The news media and individual citizens with an interest in natural resources and outdoor recreation are also important Bureau clients.

News Section

The News Section prepares and distributes news releases for use in all Minnesota newspapers, radio and television stations and special-interest publications dealing with natural resources. More than 800 news releases were distributed during the Biennium. The section prepares short radio announcements dealing with emergency situations, trail conditions, hunting and fishing seasons, new regulations and outdoor safety hazards. The section also schedules news conferences, supervises the DNR building at the state fair grounds and maintains a clipping service for DNR staff use.

Section employees also write feature stories about DNR programs and activities available to the public.

Publications Section

The Publications Section provides editorial and production assistance to DNR divisions that want to produce their own publications and responds to thousands of phone, walk-in and mail requests each year inquiring about DNR activities and the natural resources of Minnesota.

All divisions of the DNR produce publications with the help of the Bureau of Information and Education -- from writing to the finished printed product.

These publications consist of a variety of items: a manual on trapper education; booklets on small game in Minnesota; brochures on the Minnesota Conservation Corps and on the sale of public lands; a pamphlet on Project CORE (fisheries projects that bring together private sportsmen's groups and local governments); a guide to Minnesota's prairies; a four-color bluebird poster publicizing the Nongame Wildlife Program; a handbook for turkey hunters; a sign for Conservation Officers to place in butcher shops on game-animal rendering; labels for a herbarium; a book of plans for building 27 homes for wildlife; and the annual waterfowl, pheasant and trout stamps for hunters and anglers.

The Bureau also produces its own publications, among them "DNR Reports," a series of 106 leaflets pertaining to subjects on which the Bureau often gets information requests. Some subjects: waterfowl, whitetail deer, lakeshore living, heating a home with wood, fishing with leeches, plans for birdhouses.

Every other month, the Publications Section publishes the DNR's magazine, The Minnesota Volunteer. The Volunteer is circulated free to 90,000 subscribers in Minnesota, including all colleges, senior high schools and public libraries. Its readership for each issue numbers about 360,000. The editorial goal of the Volunteer: the conservation and wise use of Minnesota's rich natural resources through education. Articles feature some aspect of the DNR's conservation effort. Sample titles: "Hunt for the Deadly Lamprey," "Inviting the Bluebird Back to Minnesota," "Counting the Chippewa's Eagles," "On Guard Against Dam Failure," "Will the Piping Plover Survive?" "Minnesota's Pending Water Crisis," "Lead Shot: Silent Killer of the Flyway," "Hypothermia: When the Body's Furnace Fails," "Can We Really Protect Minnesota's Groundwater?" and "Oil in the North Star State?"

Environmental Education Section

The Conservation Education Act of 1976 and the enabling Legislative Act of 1978 give the Bureau primary responsibility for developing education programs for school-age children and adults, including Outdoor Education, Natural Resources Education, and the Minnesota Advanced Hunter Education program for adults.

To make these programs work and to encourage public participation, this Environmental Education Section has established an outstanding corps of trained volunteer instructors, and has received excellent support from Minnesota conservation organizations.

Since the inception of the education program (1970), more than 60,000 participants have received in-service training. The Bureau designs and publishes educational materials for distribution through its workshop programs.

These programs are addressed to the general public, school-age children and for adult hunters who may participate in 16-hour classes, two-hour clinics or one-day seminars.

Advanced Hunter Education is a public information program dedicated to Minnesota sportsmen (16 years and older) and their continued efforts to preserve wildlife habitat and the privilege of hunting. The program is designed to create better-informed hunters and deal with hunter attitudes and their behavior, to improve hunter-landowner relationships, improve hunting ethics and encourage sportsmanship.

The program operates presently with 300 volunteer instructors, which are trained by the DNR. They are provided with a training manual, a quarterly newsletter, teaching and classroom props and numerous handout reading materials.

Audio-Visual Section

The Audio-Visual Section provides photographic services for all department disciplines and DNR Regions. It produces audio-visual support units for hunter education and instructor training programs and produces or assists Department disciplines in producing slide presentations, scripts and films.

Public-service television announcements cover diverse issues, such as protection of groundwater and the opportunity for public contribution to the Nongame Wildlife Fund. These are distributed to all commercial or cable television stations in Minnesota and bordering states.

The Bureau Photo Lab handled more than 1,500 photo requests during the Biennium. The requests range from film processing and contact sheets to copy work from flat art or maps to special graphic techniques using photography.

The Film Loan Service distributes free films on natural resources subjects for 10,000 to 12,000 viewings by more than 900,000 persons in schools or state park naturalist programs as part of an up-to-date educational program. The Film Loan Service also furnishes film support for both Hunter Education instructors and Firearm Safety instructors.

Boat and Water Safety Section

The Boat and Water Safety Section coordinates the boat and water safety activities of the Department and acts as liaison with the U.S. Coast Guard, other states, other state departments, counties, public and private safety groups and the general public.

One of the primary tasks of the section is to administer the legislatively mandated Boating Safety Education Program for 13- to 17-year-olds. Since its inception in 1975, the program has certified more than 60,000 teenagers.

Other activities during the Biennium included the following:

- * Distribution of approximately 100,000 pieces of general boating safety information; printing 200,000 copies of the Boating Guide (law synopsis) and 5,000 copies of the exact statutes and rules each year.
- * News releases, stories, television and radio appearances.
- * Displays at two Twin Cities boat and sport shows each year (average attendance: 375,000 per year).
- * Training sessions conducted for 300 county sheriff's deputies and DNR conservation officers.
- * Distribution of nearly \$1 million in county boat and water safety grants each year.

- * Administration of state and federal boating safety funds, including financial and technical support of the Enforcement, Parks, and Trails and Waterways divisions.

Minnesota's boating fatality rate has dropped to less than half the national level. Future efforts will be directed at keeping the water accident rate down by:

- * Sponsoring an "implied consent" bill for boaters and educating them about the problems of alcohol and boating.
- * Keeping funding at a level that will provide for a viable Boat and Water Safety program.
- * Providing more informational and educational materials to the public.

* * *

MINNESOTA ENVIRONMENTAL EDUCATION BOARD

The Minnesota Environmental Education Board (MEEB) has been associated with the Department of Natural Resources for administrative purposes since 1978.

State statutes mandate that the MEEB "encourage development of life values and a style of living which fosters the constructive use, rather than exploitation of natural resources and the environment"; and "promote coordination among various groups and institutions, development and distributing environmental education materials, including but not limited to formal and non-formal education, pre-kindergarten through grade twelve, post-secondary, vocational, college and adult education."

The Board and its 13 regional councils meet these charges by providing information about programs on environmental issues important to those regions; by assisting other agencies and organizations to implement such programs; and by promoting environmental education in the formal education system.

General Structure

The MEEB system comprises a state board and 13 regional councils composed of 197 volunteers. The state Board consists of one representative from each of the regional councils and six at-large members appointed by the commissioners of the departments of Natural Resources and Education. The Board and councils are served by a staff composed of an executive director, four regional coordinators and three secretaries. The Board is aided by six ex-officio members representing state and federal agencies active in environmental education and information: the state departments of Education and Natural Resources, Minnesota Pollution Control Agency, Minnesota Education Association, Agriculture Service and the U.S. Soil Conservation Service.

Services Offered

People served by MEEB's regional volunteers include elementary and secondary students and teachers, participants in community education courses, college students, elected officials and many others.

Each regional council develops a work plan every spring to determine what environmental education programs it will design (or co-sponsor with cooperating groups or agencies) to reach the people in its respective multi-county area.

During the Biennium MEEB produced programs, such as the following:

- * Radio Tape Series: "Your Own Backyard," a 15-minute weekly broadcast on topics such as acid rain, hazardous waste, energy audit, nongame wildlife and wood residue as fuel. This series reached 75,000 to 100,000 Minnesotans each week from January to June 1983. Thirty stations carried the programs and are eager to receive new materials in the series. Some continue to broadcast programs generated in 1983 because they continue to be of general interest and importance. Cost

-- \$11,000 (a grant from the Minnesota Humanities Commission). Value
-- \$91,948 (figure from budget of grant application to the Minnesota
Humanities Commission).

* Project WILD: An interdisciplinary, supplementary, environmental and conservation education program emphasizing wildlife. It was designed for use by teachers in all major areas of study in kindergarten through 12th grade. In Minnesota 36 workshops have been held, 117 leaders have been trained and more than 1,000 teachers and naturalists have been trained by these leaders. Project WILD is conducted in cooperation with the DNR Nongame Wildlife Program and the Department of Education.

Other effectiveness measures for the Biennium include the following:

	<u>FY 83</u>	<u>FY 84</u>
Programs Completed	158	239
Citizens Reached	23,862	45,239
Regional Coordinators	2.5	3.25
Programs per Coordinator	63	74
Citizens Reached per Coordinator	9,545	13,919

* * *

LAND MANAGEMENT

Management of the state's land base is an integral part of natural resource administration. The Bureau of Land is responsible for land management services and activities associated with the 5,279,700 acres of DNR-administered land (including trust fund lands held in trust for the citizens of the state), and an additional 2,797,100 acres of tax-forfeited land administered by the county.

Major land programs administered by the Bureau are: management of DNR land records; leases, licenses and easements; and land acquisition, sales and exchange. Constant maintenance and improvement of the land programs was necessary (and is continuing) to achieve more responsible management of the state's natural resources.

Progress toward that goal was made during FY 83 and FY 84 when the Bureau of Lands successfully obtained important changes in the law by working through DNR, other agencies and the legislative process. Both the authority to sell DNR-administered surplus land and the authority to review land acquisition appraisals were transferred from the Department of Administration to the Department of Natural Resources with the expectation that efficiency in both programs will be improved.

Other 1984 legislation initiatives gave the Department the authority to establish a revolving fund for land acquisition, comprising the proceeds from the sale of surplus land, gifts and other valuable property; and put on the ballot for the November 1984 election a constitutional amendment that would allow the exchange of trust fund land with other state lands. Another major piece of legislation involved Consolidated Conservation Area (Con-Con) lands and ditch assessments that required the DNR to prepare a land acquisition and disposal plan for the Con-Con counties and to promulgate rules governing the payment of ditch assessments. Each of these requirements will improve DNR's land base management efficiency.

The administration of the land records system includes the keeping and maintenance of records, maps and documents relating to land ownership rights and transactions. This system spans nearly all programs in the Department. Comprehensive land records are available on trust fund, consolidated conservation, tax-forfeited and acquired lands. Information such as land acquisition source and land classification is used daily by the Bureau and DNR divisions to assure appropriate management of specific lands. The Bureau determines the amount of the in-lieu tax payments due to counties using the record system. The total in-lieu payment in FY 83 and FY 84 was \$11,238,000.

The Land Bureau also maintains records for the state leasing, licensing and easement programs. The management information was automated and made available to the field offices statewide during FY 84.

The purpose of these programs is to generate revenues to the trust fund and general fund while providing a means for individuals and commercial firms to rent state lands for a variety of uses, as long as such uses do not impair future DNR management objectives or seriously impact general public use of the resource. Common uses by individuals or firms include utility and road

rights-of-way, agricultural, wild rice paddy, lakeshore and hunting cabin sites, gravel removal, access easements and cooperative farming agreements.

Currently, the total number of leases, licenses and easements of record is 5,761. Program revenues generated to the state during FY 83 and FY 84 amounted to \$2,336,100.

Summary of Lease, License, Easement Program Revenues

	<u>FY 83</u>	<u>FY 84</u>	<u>TOTAL</u>
Number of Transactions	5,441	5,761	11,202
Acres	46,496	51,229	97,725
Revenues	\$1,341,878	\$994,200	\$2,336,078

The state land acquisition, sales and exchange program activities continued to make progress in varying degrees during the report period. Land sales are one of the management options DNR has, whereby lands considered better suited for private development and surplus to the state needs for resource management can be sold. They are relatively few and generated a small income during the past two years.

Summary of DNR Land Sales Revenue

	<u>FY 83</u>		<u>FY 84</u>		<u>TOTAL</u>	
	<u>Acres</u>	<u>Amount</u>	<u>Acres</u>	<u>Amount</u>	<u>Acres</u>	<u>Amount</u>
Trust Fund	540	\$104,950	86	\$18,100	626	\$123,050
Con Con	342 & 24 lots	<u>\$ 58,960</u>	19 lots	<u>\$ 4,700</u>	342 & 43 lots	<u>\$ 63,660</u>
Total		\$163,910		\$22,800		\$186,710

Land sales in the near future may be accelerated with the establishment of the revolving land fund. However, the recent state policy has been (and still is) to generally retain land in public ownership.

Land exchange has been recognized as an important tool in land management for decades and it provides the most feasible means to adjust state ownership patterns. Accelerated land management planning, especially in the Division of Forestry and the Department's long-range land resource planning project (suitability), has resulted in an increased awareness of the potential benefits of the exchange process. An increase in the number of land exchanges will likely result if the proposed constitutional amendment is ratified. Full-time staff was assigned to the program four years ago, marking the beginning of a trend toward overall program improvement that has carried through this review period.

A major accomplishment during FY 83 was the development of the DNR Commissioner's Procedural Guidelines for Land Exchanges, Land Title Transfers and Other Duties Relating to the Land Exchange Board. These guidelines improve the expediency of a long and complex procedure.

The acreage and value of exchanges completed during the report period is follows. In addition, two land transfers of Class A land were completed which involved 220 acres of state and 255 acres of county land, both valued at \$62,000.

Summary of Land Exchanges Completed
FY 83 and FY 84

<u>Land Class</u>	<u>Exchanges Completed</u>	<u>Private or Federal Acres</u>	<u>Value</u>	<u>State or County Acres</u>	<u>Value</u>
Class A	26	5,442.025	\$1,505,645.00	4,754.194	\$1,494,845.00
Class B & B-C	16	2,080.850	930,294.50	1,619.520	944,066.14
Class C	6	23.430	36,110.00	8.530	38,620.00
State-Federal	1	579.000	501,625.00	760.000	501,150.00
Totals	49	8,125.305	\$2,973,674.50	7,142.244	\$2,978,681.14

A: All lands under control of the Commissioner of DNR.

B: Tax-forfeited lands.

C: Lands in state parks or on public waters.

The purpose of the DNR land acquisition program is to purchase land of strategic importance for the major resource management programs. The Land Bureau provides the necessary real estate services and is responsible for guiding and executing most land purchases. Services include obtaining appraisals, negotiating with landowners, handling relocation problems, obtaining surveys and working with legal staff, private interest groups and local political subdivisions. Most acquisition is outright purchase of the land, but many permanent and term easements are also acquired especially in Fish Management Areas and Water Bank acquisitions. DNR acquired an interest in a total of 292 parcels affecting 13,660.98 acres in FY 83 and FY 84. An acquisition summary by program follows.

Summary of DNR Land Interests Acquired
FY 83 and FY 84

<u>DNR Program</u>	<u>Parcels</u>	<u>Acres</u>	<u>Expenditures</u>
Canoe & Boating Routes	2	26.50	\$ 35,600.00
Fish Management Areas	46	219.41	297,410.00
Scientific & Natural Areas	9	894.39	206,400.00
State Forests	17	342.80	161,466.00
State Parks	14	447.68	916,340.00
State Trails	13	143.96	235,544.86
Water Access Sites	50	81.86	1,482,815.50
Water Bank	46	1,606.72	547,442.71
Wild & Scenic Rivers	4	80.95	13,195.00
Wildlife	91	9,841.21	3,296,382.00
Totals	292	13,685.48	\$7,192,596.07

* * *

ENGINEERING

The Bureau of Engineering is a multi-discipline design team composed of architects, engineers, land surveyors, landscape architects and technicians. They provide professional design and construction services for the development and operation of DNR administrative, recreational and natural resource facilities, including campgrounds, water accesses, hiking and biking trails, roads, bridges, dams, building facilities, interpretive centers, fish hatcheries and forest nursery facilities. The Bureau also is responsible for land surveying and mapping services required to locate land and prepare topographic maps needed for design activities; and graphic services for the layout and production of displays, recreational maps, resource maps, informational signs and interpretive displays.

During the period from July 1, 1982, to June 30, 1984, the Bureau had more than 400 development projects under construction with a total value in excess of \$10 million. These involved providing detailed design, the preparation of construction documents and construction contract administration for each project.

In addition to the development projects, the Bureau has completed 180 boundary surveys and provided professional advice and technical assistance to the DNR on a continual basis.

The more significant projects the Bureau provided professional services for during this period included the following:

- * The design development and initial construction of Split Rock Lighthouse State Park on the North Shore of Lake Superior. This included roads, buildings, and water and wastewater systems.
- * The design and installation of wood-pellet heating systems at the French River Hatchery and General Andrews Forestry Nursery.
- * The design and development of 75 DNR water access sites, including a major access on the mouth of the St. Louis River (Rices Point) and on the Mississippi near Hastings (J.C. Park).
- * The design and construction of the Elysian Trail Center Building on the Sakatah Trail. This building is located at the site of the original train depot and architecturally reflects the original design.
- * The graphic design of multi-colored recreational user maps for Minnesota Valley trails, National Wildlife Refuge and recreation areas.
- * Standard construction specifications were developed for DNR projects and distributed to design staff.

The application of computer technology has improved the Bureau's effectiveness, and it is the Bureau's intent to search for other applications and methods to further increase effectiveness.

* * *

FINANCIAL MANAGEMENT

The primary objective of the Bureau of Financial Management is to develop and maintain more efficient and effective accounting and financial information for the Department and to assist management in the analysis and interpretation of this information to aid the decision-making process.

The Bureau is responsible for providing basic accounting and budgeting services in direct support of all natural resource programs administered by the Department. These services include the following: establishing and maintaining the chart of accounts in the Statewide Accounting System; coordinating the preparation of annual spending plan allocations; providing complement control by fund for all full-time positions authorized by the Legislature; providing allotment and encumbrance control; processing invoices for payment; performing contract management and review for consultant services, professional and technical services, and purchased services; properly recording and depositing receipts; preparing receipt forecasts; providing monthly standard reports generated from and distributed by the SWA; computing and negotiating the annual federal indirect cost rate; monitoring the reconciliation of regional imprest cash accounts; coordinating the preparation of the biennial budget request; preparing financial statements for the Game and Fish Fund; and monitoring annual spending plan allocation and expenditures.

The Bureau of Financial Management coordinates the development and implementation of all financial management policies and procedures in the Department. This involves the review and interpretation of statewide directives issued by the Department of Finance, as well as the formulation of internal operating projects and procedures.

On July 1, 1983, the Bureau of Financial Management implemented Phase I or the new DNR Revenue Accounting System. Phase I was designed to replace the old revenue system, which was primarily a manual system aided by cumbersome card files and extensive use of clearing accounts. The immediate benefits realized from the new system include the elimination of the pink and white card files; increased opportunities to post receipts directly to the appropriate revenue accounts; establishment of a data base for monthly, quarterly and annual revenue reports; and improved control and audit trails.

The following is a summary of the major accomplishments of the Bureau of Financial Management:

	<u>FY 83</u>	<u>FY 84</u>
Receipts Processed	\$47,519,600	\$49,119,200
Budget/Expenditures	\$81,529,700	\$93,915,500
Approved Complement	1,660	1,645
Federal Indirect Cost Rate (percentage)	21.2	27.9
Fund Statements Developed	10	10
% of Appropriation Cancellations	2.2	.9
% of Invoices Processed in 30 Days	79	82
Single Audit Statements Developed	3	3
% of Receipts Directly Deposited	60	95
Contracts Awarded (Set-Aside Program):		
% Small Business	N/A	54
% Non-SED	N/A	24
% SED	N/A	30
% Non-Small Business	N/A	10
\$ Other Governmental Agencies	N/A	36

* * *

PERSONNEL

The Bureau of Personnel recruits, selects and maintains a representative work force that is well qualified, motivated and productive. The Bureau also provides technical direction to DNR managers. Through the Bureau, the DNR maintains a work force of approximately 1,700 full-time and up to 1,400 seasonal and part-time employees in more than 120 different job classifications.

Bureau staff members work closely with Department managers and the State Department of Employee Relations' Examining and Referral Division in developing examinations, preparing recruitment literature, planning recruitment activities and conducting placement interviews. During the Biennium 75 examinations were developed or revised to enable the Department to fill its vacant positions promptly.

The Bureau of Personnel classifies positions within the Department through the conduct of individual job audits or major classification studies and maintains salary equity among Department employees. During this Biennium 955 job classifications were reviewed. Included in this number was a major classification study involving 124 positions in the Department's Division of Parks and Recreation. In addition, the Bureau conducted a classification review of area hydrologist positions assigned to the Department's Division of Waters and studied more than 200 positions in the Division of Fish and Wildlife.

The Department's performance appraisal system is administered by the Bureau of Personnel with training and technical direction provided to Department managers in position-description writing and performance evaluation. During the Biennium the Bureau developed a performance appraisal training program specifically designed to meet the needs of the Department, and consistent with the uniform statewide performance appraisal system. This training is mandatory for all Department managers and supervisors. The training is being conducted by Bureau of Personnel staff and regional business managers. An immediate result of the training is a clarification to each employee of his role in the organization, and ultimately an improvement in the quality of work being performed through a more effective method of evaluating and monitoring employee performance at all levels in the organization.

The Bureau of Personnel directs the preparation and processing of the payroll for a work force that numbers more than 3,000 during the peak summer season. The Bureau is responsible for developing personnel policies and procedures; preparing and processing personnel transactions; and conducting payroll audits. During the Biennium more than 32,000 personnel transactions were processed and approximately 140,000 payroll warrants were issued to Department employees.

The Bureau provides direction in administering negotiated agreements, interpreting contract language, addressing disciplinary matters and resolving grievances through the grievance processes established in union contracts. It directs the Department's participation in unit clarification hearings and in negotiating contracts with employees' unions in eight separate bargaining units. No major unit clarification issues were addressed during this period.

However, 55 grievances were processed; 97 percent were resolved without arbitration.

We can look forward to a change in the Department's work force that will require a greater degree of attention to individual employee needs, such as career mobility, career counseling, recognition, job enrichment, child care, job sharing and participative management.

There is an increasing need for data-processing capabilities in the personnel field, to provide more accurate and timely management information to more effectively manage human resources.

* * *

LICENSE BUREAU

The License Bureau administers the issuance of all cross-country skiing, hunting, fishing and trapping licenses (both recreational and commercial) as authorized by law; and administers the selection, by lottery, of bear, turkey, moose and antlerless deer hunting permit applications.

County Auditors are agents of the Commissioner in the sale of these licenses, and they may appoint sub-agents (sports shops, resorts) to make the licenses readily available for purchase.

The License Bureau also administers the issuance of watercraft, snowmobile, and three-wheel off-road vehicle registrations. Authorized deputy registrar's of motor vehicles serve as agents of the Commissioner in the sale of these registrations.

The 1983 Legislature passed a new law, believed to be the first of its kind in the country, which requires cross-country skiers 16 to 65 years old to have a license if they ski on trails that are mapped, signed, promoted or publicized by the DNR or by local governments. Licenses cost \$1 for a daily permit, \$5 for an annual permit and \$7.50 for a husband-wife combination annual permit. Skiers who use federal lands or who break their own trails do not need a license.

Although the first year of issuance (1983-84) was strictly on a voluntary basis, there were 12,988 individual, 12,513 combination and 9,025 daily licenses sold -- which generated \$163,137.50 in revenue. The Department estimated that it would collect \$250,000 in license fees in the winter of 1984-85. The money will go into the general fund, and will help pay for ski trails and their maintenance in state and local parks.

Legislation passed in 1983 required persons age 16 to 64 who hunt pheasants to purchase a \$5 pheasant stamp. The revenue generated from the sale of the stamp is used to improve habitat to increase the pheasant population.

The DNR's biennial moose hunt was held in 1983. A total of 19,861 parties of four (79,444 individuals) applied for 1,296 permits. This was the seventh moose hunt, and permits are highly desired by Minnesota sportsmen.

In addition to the moose lottery, the Bureau helped with the bear, turkey and doe lotteries. This is the third year of a preference system on the doe lottery, and indications are that it will be one of the more popular; more than 275,000 individuals applied for 156,350 permits.

Game and Fish license sales for 1982 again totaled more than 2.5 million, which produced approximately \$21 million in revenue. Watercraft registrations remained at a high level this past year with a total of 610,177 valid watercraft licenses. This total again places Minnesota second in the nation. DNR snowmobile registrations dipped from 220,000 the previous year to 207,000 current valid registrations.

* * *

FIELD SERVICES

The Bureau of Field Services provides support services to Department personnel so that resource managers' involvement is minimized and their needs are met promptly. It is also the objective of Field Services to coordinate DNR activities and to satisfy the policies, procedures and reporting requirements required by other state agencies.

This program provides the following support functions for the Department:

- * The purchase of all equipment and material needs.
- * The repair and modification of equipment in the Field Services shops.
- * The maintenance of more than 1,600 DNR buildings, which total two million square feet. The letting of more than 320 regional bids each fiscal year for building maintenance projects.
- * A variety of other support activities: inventory management of fixed assets, semi-expendable and consumable inventories; administration, implementation and enforcement of on-the-job safety programs; surplus equipment and building disposal; screening and acquisition of state and federal surplus property for use in the DNR; operation of a Department shop for routed-wood signs; coordination of the radio communication needs of the Department and the installation and repair of the radios; administration and maintenance of a statewide cache of forest fire-fighting equipment; and the operation of equipment pools.

Field Services accomplished the following during the Biennium:

- * Developed specifications and processed 1,810 requisitions in FY 83 and 1,970 in FY 84.
- * "Downsized" 20 vehicles in FY 83 and 23 in FY 84 to save fuel.
- * Provided fire cache equipment to two fires in FY 83 and to one in FY 84.
- * Hired a safety officer to develop and implement a comprehensive health and safety program.
- * Improved accuracy and control on fixed-asset inventory.
- * Completed a central office inventory audit and completed a class code study, which resulted in a reduction of inventory class codes used in DNR.
- * Completed consumable inventory follow-up to measure effectiveness of the prior biennium's reduction.
- * Evaluated and rated (annually) all self-propelled vehicles to determine condition, mileage and need.

- * Maintained updated computer runs (for evaluation and control) on self-propelled equipment, buildings and radio equipment.
- * Acquired federal excess property for eligible programs, including rural fire protection program.
- * Consolidated two DNR facilities and disposed of 13 buildings.
- * Changed inventory format to include vehicle license numbers.
- * Distributed surplus Forestry radios to Parks, Minerals and Trails to improve Department radio communications.
- * Reduced snowmobile complement by 10 percent.
- * Conducted firearms and radio inventory.
- * Developed a Right-to-Know training program.
- * Established aircraft task force, which developed a policy for use of DNR aircraft.
- * Reduced sign shop order backlog from eight months to two months.
- * Installed 29 wood stoves to save energy.

* * *

MANAGEMENT INFORMATION SYSTEMS

The Department has made a continuous effort during the last year to strengthen and make better use of the Management Information Systems. This effort was made possible by a \$600,000 grant by the Legislative Committee on Minnesota Resources (LCMR).

Some of the major accomplishments include the following:

- * MIS training sessions for 200 DNR managers and supervisors.
- * The activation of a MIS Technical Committee to review and develop policies for MIS activities. Subcommittees have been making good progress on data standards, software, systems design standards and office automation.
- * Completion of an office automation plan for the administrative service units of the Department.
- * Standardization of word-processing equipment for the department and the installation of word-processing equipment in all department administrative service units and operating divisions.
- * The establishment of a DNR word-processing training center and training of 70 Department employees.
- * The installation of an IBM System 38 computer in the DNR. The Department is redesigning and transferring administrative procedures to this equipment.

* * *

RECORDS AND OFFICE SERVICES

The Bureau of Records and Office Services provides information to the public and various essential support services for all disciplines within the DNR, including liaison duties between other state departments and agencies.

A cost study was conducted on DNR forms handling, including design, redesign, printing methods, inventory, receiving, storing, packaging, distribution, and shipping. When the study was finished, all Department forms were removed from the Central Stores Division and placed under the control of the Bureau of Records and Office Services, where several effective cost-cutting methods were established and are now in use.

* * *

OFFICE OF YOUTH PROGRAMS

The Office of Youth Programs operates the Minnesota Conservation Corps (MCC), a "work-earn-learn" program dedicated to resource and human conservation. It has two components: a summer program for high school youths, ages 16-18, and a year-around program employing 18- to 26-year-old adults.

In the summer component, the youths work a 35-hour week and receive five hours of experiential environmental education. In the year-around component, the young adults work a 40-hour week for up to 12 months. Corps members receive the federal minimum wage and do not qualify for benefits other than Worker's Compensation. The assignment of a corps member cannot result in the displacement or reduction in hours of a regular full-time or seasonal employee.

Approximately 150 youths and staff members are employed in the summer program, whereas the young-adult program has 65 12-month jobs. Unique elements of the summer program were the hearing-impaired camps located at Tettegouche and Itasca state parks. Thirty-four youths from across the state spent their summer living and working in the north woods. They proved time and time again that being hearing-impaired need not affect the learning process or work output.

The program stresses a cost-effective approach to the protection, conservation, rehabilitation and improvement of the natural, historical, and cultural resources of the state. Further, the corps stresses the development of a strong work ethic and the acquisition of work skills and attitudes. Based upon the estimated value of work accomplished, as determined by host field supervisors, the cost-benefit ratio of the MCC is \$1/\$1.34.

* * *

VOLUNTEER PROGRAMS

Volunteer Programs was formally established in FY 84 with funds provided by the Legislative Commission on Minnesota Resources (LCMR).

Volunteer Programs has a dual focus -- responding to requests both from the public to be involved in DNR activities and from DNR staff for assistance from the public.

Large numbers of Minnesotans want to help the DNR (either individually or in groups) with activities related to natural resources. Volunteer Programs trains staff members in volunteer management and assists staff in identifying needs and projects that will benefit the public but that would not be done without volunteer assistance. More than 163 new uses for volunteers were identified in FY 84.

Though volunteers have been involved in DNR activities for several years, Volunteer Programs intends to increase their use and public service.

Volunteer Programs maintains contact with various community volunteer-referral organizations, with corporate volunteer programs and with agencies that are sources of volunteers. Volunteers come to DNR through referral by these organizations, by other direct recruitment efforts by Volunteer Programs and by the volunteer's initiative.

Volunteer Programs maintains a directory of volunteer job requests and a directory of available volunteers and their skills.

Volunteers are interviewed, matched with available positions and referred to the requesting individual. More than 40 direct referrals were made during FY 84. Frequently a volunteer with special skills or training, for which no volunteer position has been identified or requested, contacts the DNR. In these instances, Volunteer Programs consults with staff to create a new position, designed for the specific volunteer.

A volunteer advisory committee, composed of representatives from all DNR divisions and programs, has been formed to ensure the proper management and use of volunteers throughout the Department.

Examples of volunteer activities or projects implemented in FY 84 include the following:

- * Research and development of a bibliography of works on Minnesota resources to accompany an environmental education program now being used in the state.
- * Completion of several Eagle Scout projects, including making covers for raceways at the Metro Fish Hatchery, and making fish silhouettes with identification for display in the fish pond at the state fair.
- * Large-scale assistance in implementation of the DNR's emergency pheasant feeding program during the severe 1984 winter.

- * Formation of a partnership with a large business corporation retiree program to "adopt" two state parks.
- * Special high school student project involving assistance with equipment maintenance.
- * Environmental education program development and presentation.
- * Maintenance and repair of bird houses in a state park.
- * Computer programming assistance.
- * Public information assistance in various DNR information booths at special events.
- * Assistance in several art projects by a professional wildlife artist.
- * Assistance in the DNR building and with DNR activities at the state fair.
- * Research, identification of potential "granting" foundations, and the writing of two grant proposals for special project funding.
- * Expert advice and consultations on accounting, marketing and other specialty areas.

Many other projects have been completed or are in progress.

* * *

