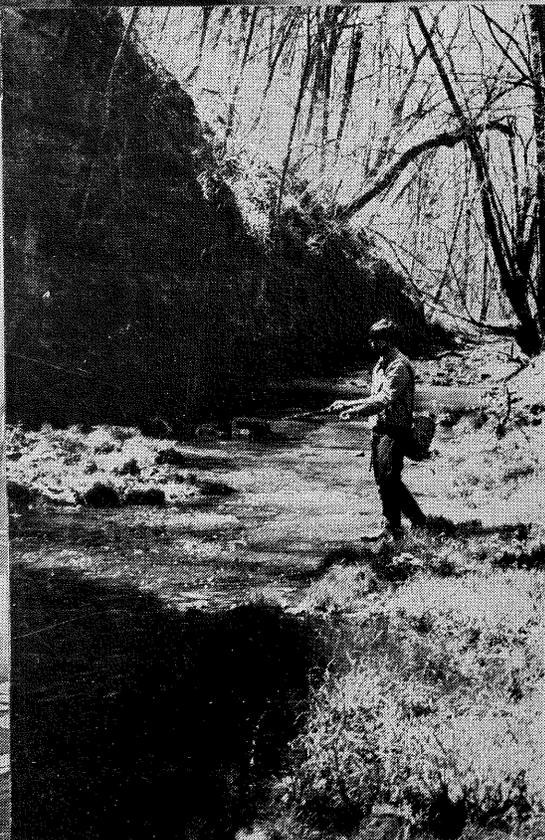
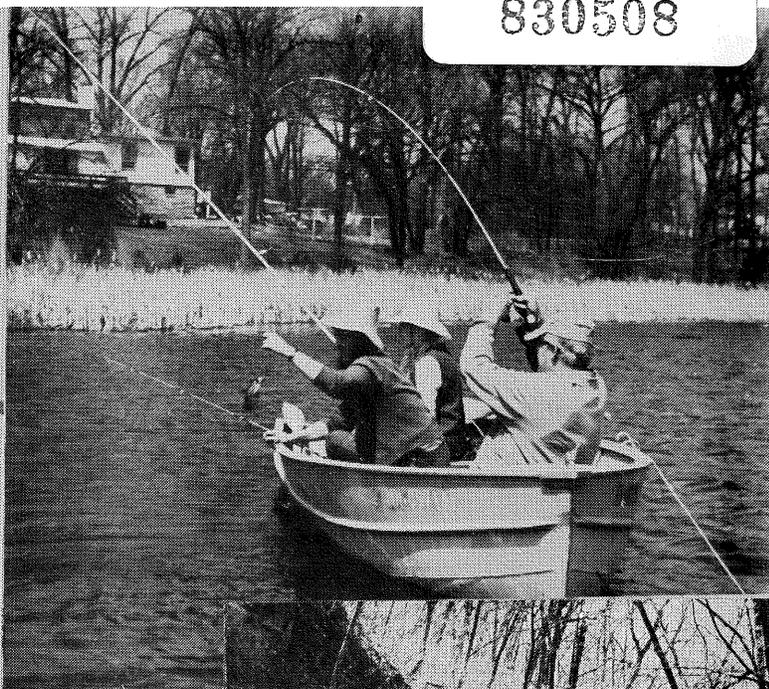


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Minnesota
Department of Natural Resources

ANNUAL REPORT 82/83

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STATE OF
MINNESOTA
DEPARTMENT OF NATURAL RESOURCES

830508

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T A B L E O F C O N T E N T S
 MINNESOTA DEPARTMENT OF NATURAL RESOURCES
 BIENNIAL REPORT 1980-1982

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COMMISSIONER'S PREFACE

This Biennial Report, covering Department of Natural Resources Operations for the period July 1, 1980 to June 30, 1982 indicates progress in the Department's existing programs, as well as noteworthy success in the administration of new or recently-inaugurated activities to support the development, protection and wise use of Minnesota's land, water and wildlife resources.

These achievements were realized notwithstanding programs and projects depressed by budget reductions reflecting state and national economic conditions. These limiting factors will continue into the 1982-84 Biennium.

Worthy of special mention is the resounding support and cooperation (including financial) DNR received from citizen participation: individuals, groups and organizations volunteering their dollars and deeds to complement the Department's management effort.

Citizen support and cooperation were demonstrated in the TIP (Turn in Poachers) program established during the Biennium, and which met with instant success as a viable enforcement tool in DNR's efforts to curb the illegal taking of protected wildlife in Minnesota. Funds for the program are provided by TIP, Inc.--a private, non-profit organization of people concerned about wildlife. In its first 1½ years of operation, more than 2,400 toll-free telephone calls were received by the Division of Enforcement from individuals reporting wild game violations; resulting in 282 arrests. Although cash awards are offered to those whose information leads to arrests, 66 per cent of the callers refused remuneration.

DNR's Nongame Wildlife Program received tremendous public support during the Biennium. Establishment of a nongame wildlife checkoff option on Minnesota's state income tax return forms provided a total of \$1.3 million during the Biennium; with 170,000 people contributing in 1981, and 196,000 individuals in 1982. While the nongame program is obviously designed primarily to benefit wildlife not traditionally hunted or harvested, it also is providing broad benefits to game species and all manner of wildlife. In addition to receiving financial support from the public, the nongame program staff is augmented by more than 500 volunteer workers.

The Division of Parks and Recreation traditionally has been assisted by hundreds of volunteer workers in operating it's system of 58 state parks, 17 waysides and 6 recreation areas.

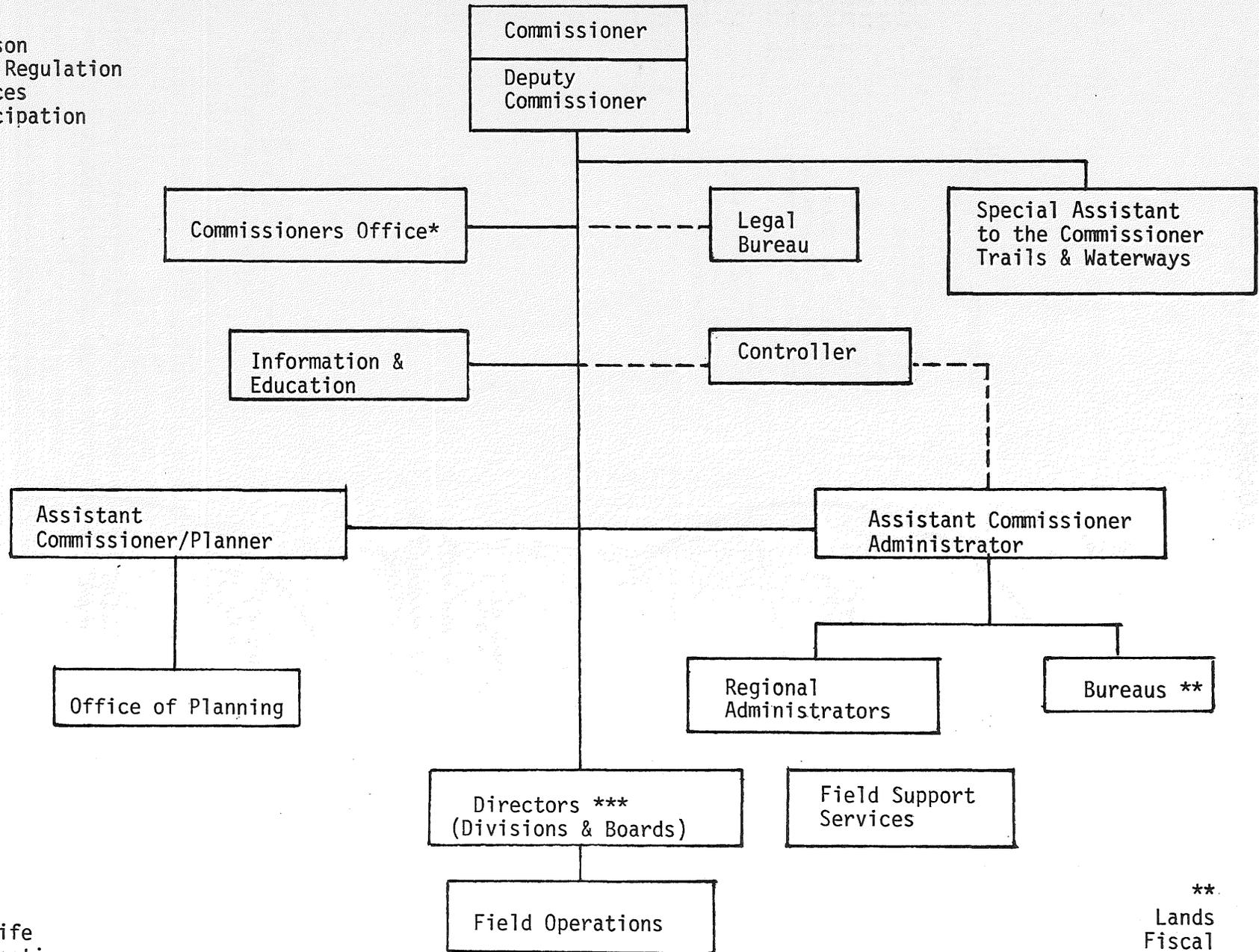
During the Biennium, citizen support provided \$24,000 of the total of \$34,000 required to construct the Von Bergen Memorial Trail in Fort Snelling State Park. This facility has been completed and is proving to be a popular addition to the historic park.

Public largess was tendered "The Minnesota Volunteer", official publication of the DNR. To assist in defraying budget cuts experienced by the Bureau of Information, which publishes the magazine, an appeal for voluntary contributions went out to the 80,000 subscribers. Respondents provided \$142,426.

DNR management and employees are deeply grateful for this public support for Department programs, and extend thanks to these and other volunteers, past and present, who have assisted in the conservation effort.

* * *

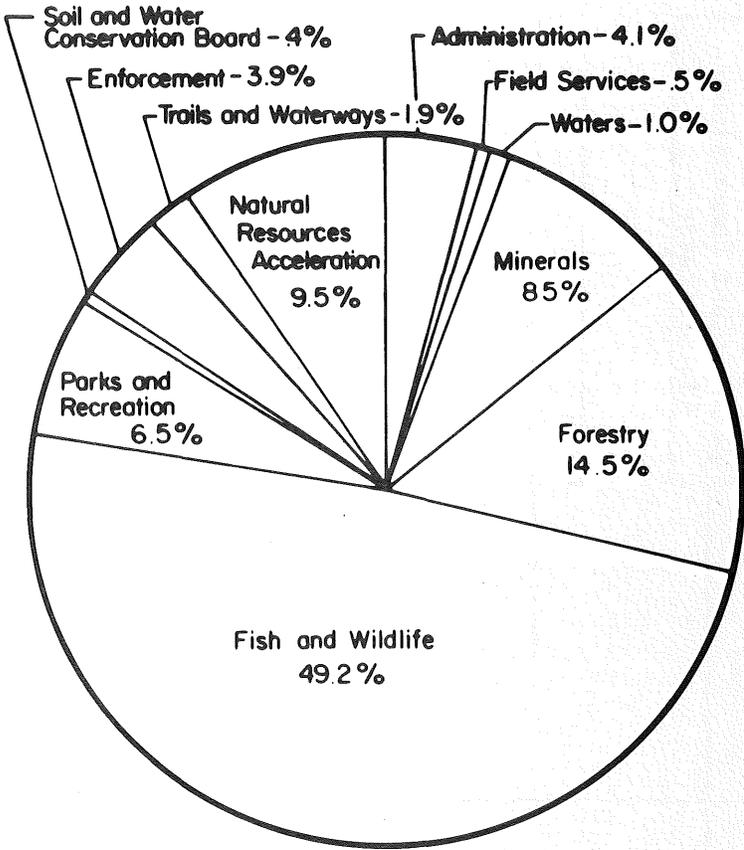
*Community Liason
Legislation & Regulation
Special Services
Citizen Participation



Waters
Minerals
Forestry
Enforcement
Fish & Wildlife
Parks & Recreation
Environmental Education Board

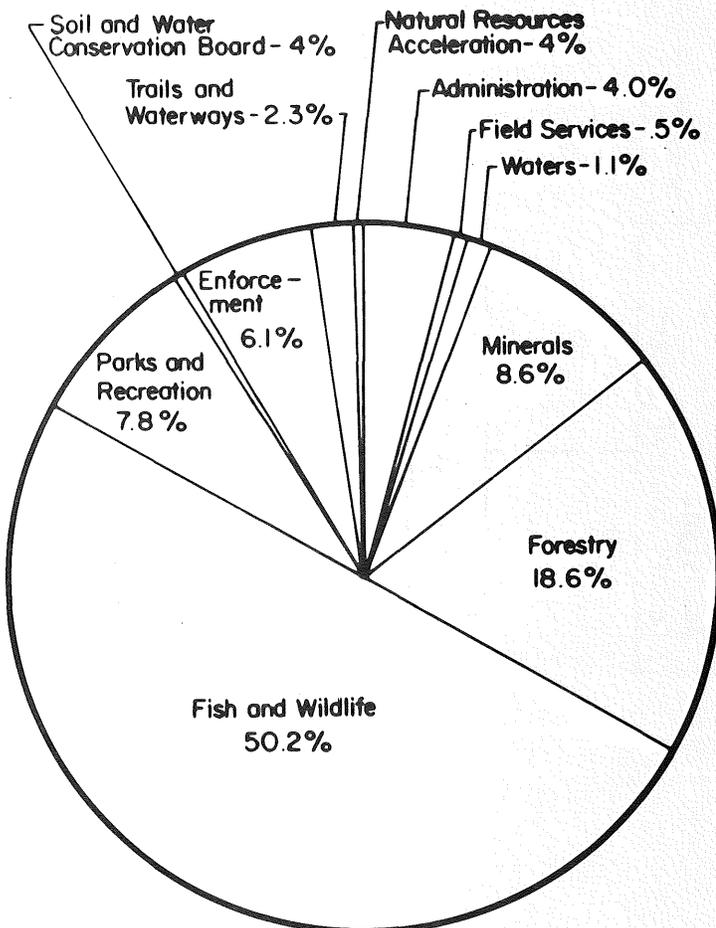
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Lands
Fiscal
Licenses
Personnel
Engineering
Field Services
Office Services Systems

WHERE YOUR NATURAL RESOURCES DOLLAR COMES FROM



F.Y. 1981
 RECEIPTS: JULY 1, 1980 - JUNE 30, 1981
 (Actual, 000's Omitted)

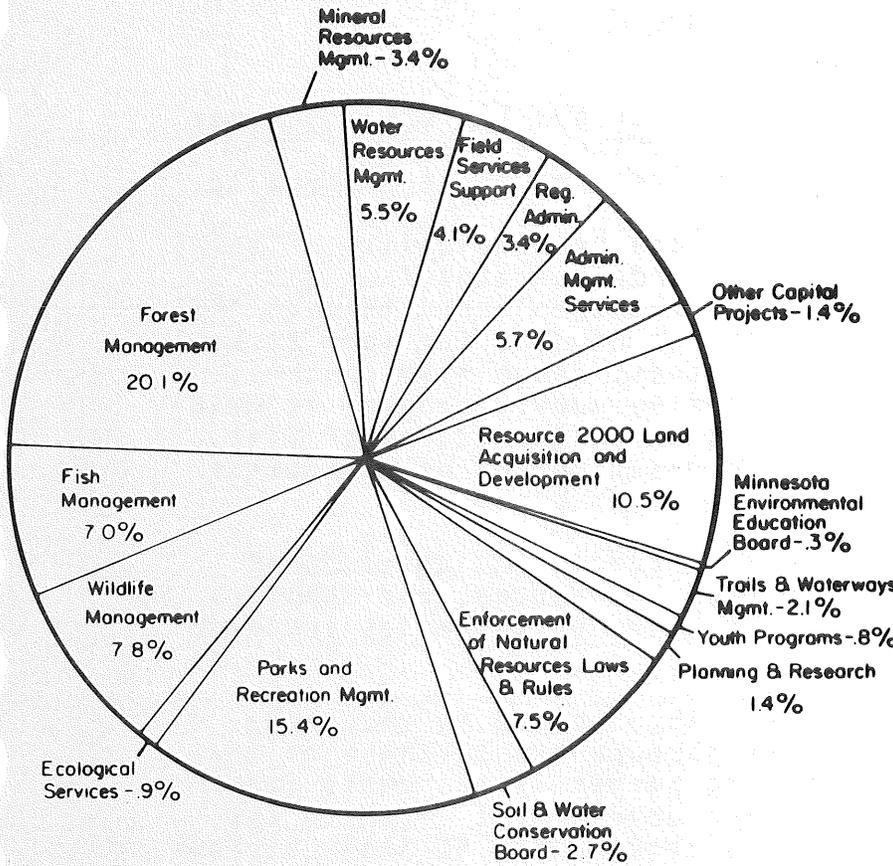
Administration	\$ 1,812.6
Field Services	234.8
Waters	461.8
Minerals	3,718.1
Forestry	6,385.5
Fish and Wildlife	21,608.6
Parks and Recreation	2,864.7
Soil and Water Conservation Board	1,708.6
Enforcement	
Trails and Waterways	827.4
Natural Resources Acceleration	4,180.0
TOTAL	\$ 43,986.0



F.Y. 1982
 RECEIPTS: JULY 1, 1981 - JUNE 30, 1982
 (Actual, 000's Omitted)

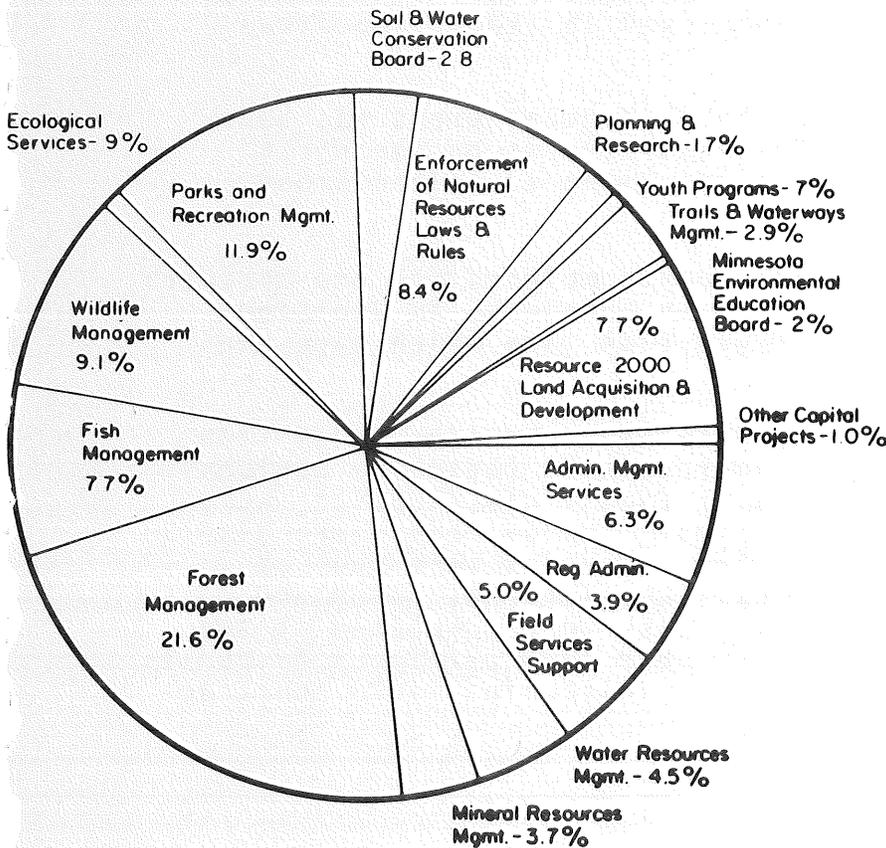
Administration	\$ 1,734.8
Field Services	216.6
Waters	483.4
Minerals	3,748.8
Forestry	8,187.3
Fish and Wildlife	21,991.1
Parks and Recreation	3,405.9
Soil and Water Conservation Board	169.5
Enforcement	2,696.4
Trails and Waterways	1,027.2
Natural Resources Acceleration	159.8
TOTAL	\$ 43,820.0

WHERE YOUR NATURAL RESOURCES DOLLAR IS SPENT



F.Y. 1981
EXPENDITURES: JULY 1, 1980 - JUNE 30, 1981
(Actual, 000's Omitted)

Admin. Mgmt. Services	\$ 5,054.1
Regional Administration	3,080.7
Field Services Support	3,676.5
Water Resources Mgmt.	4,894.1
Mineral Resources Mgmt.	2,996.7
Forest Management	17,927.7
Fish Management	6,159.6
Wildlife Management	6,965.9
Ecological Services	788.3
Parks & Recreation Mgmt.	13,775.8
Soil & Water Conservation Board	2,457.6
Enforcement of Natural Resources Laws and Rules	6,717.8
Planning & Research	1,293.2
Youth Programs	789.7
Trails & Waterways Mgmt.	1,920.7
Minnesota Environmental Education Board	261.2
Resources 2000 Land Acquisition & Development	9,380.6
Other Capital Projects	1,240.0
TOTAL	\$ 89,380.2



F.Y. 1982
EXPENDITURES: JULY 1, 1981 - JUNE 30, 1982
(Actual, 000's Omitted)

Admin. Mgmt. Services	\$ 5,496.8
Regional Administration	3,389.0
Field Services Support	4,363.8
Water Resources Mgmt.	3,921.4
Mineral Resources Mgmt.	3,176.1
Forest Management	18,711.7
Fish Management	6,672.1
Wildlife Management	7,826.8
Ecological Services	751.1
Parks & Recreation Mgmt.	10,319.0
Soil & Water Conservation Board	2,413.7
Enforcement of Natural Resources Laws and Rules	7,303.5
Planning & Research	1,515.2
Youth Programs	555.9
Trails & Waterways Mgmt.	2,490.9
Minnesota Environmental Education Board	151.7
Resources 2000 Land Acquisition & Development	6,712.2
Other Capital Projects	871.6
TOTAL	\$ 86,642.5

FISH MANAGEMENT

Part of Minnesota's wealth lies in her 2.6 million acres of fishing lakes and 17,000 miles of fishing streams. This provides fishing recreation for two million anglers annually.

Management of the 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; improvement of habitat for game fish; propagation and distribution of fishes; rough fish control; and lake rehabilitation. An extensive survey program is maintained to provide current information on the status of fish populations, as the basis for the distribution of management and research efforts.

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

Physical habitat development is preceded by obtaining control of fish management sites through the purchase of the land in fee title, or by acquiring perpetual easements for the necessary rights of access and development. During the Biennium, corridor easements were acquired on 40 trout streams, for a total of 49 miles (745 acres) of fishing access. Management and negotiations (appraisals) are in progress for easements on 20 streams totaling 18 miles (264 acres) of fishing access. Three northern pike spawning areas have been purchased. Five others, totaling 34 acres, are being negotiated. Two northern pike spawning areas are being appraised in the Metropolitan area.

Stream improvement through habitat development has benefited seven miles along six steelhead streams on the North Shore of Lake Superior, and 27 miles along 13 inland trout streams.

Construction contracts have been completed for one northern pike spawning area and two rough fish barriers, in addition to the three barriers and one rough fish trap which have been constructed.

The Fisheries construction crew repaired five rough fish control barriers. Three major improvements (hatchery effluent pond, water supply bypass and water supply distribution) were made at two trout rearing facilities. Improvements were also made on three walleye rearing sites. Repairs were made at four northern pike spawning areas, two fisheries sites and two rough fish traps. Five repair jobs were completed at two Area Headquarters. These projects were done partly by fisheries force account, through the use of the Fisheries field construction crew.

Fisheries habitat protection was accomplished through the review of several hundred permit applications under M.S. Chapter 105; U.S. Corps of Engineers (404 permits) and Minnesota Environmental Quality Board purview.

During the Biennium, a total of 635,424,360 fish of all sizes were reared and distributed, mainly from the following facilities:

- 17 Walleye Spawning Stations
- 13 Walleye Hatcheries (six of which also hatch sucker eggs and 2 of which also hatch muskie eggs)
- 237 Walleye Rearing Ponds
- 3 Muskie Spawning Stations
- 13 Muskie Rearing Ponds
- 8 Sucker Spawning Stations (to supply food for muskies)
- 5 Trout Hatcheries and Rearing Stations
- 51 Controlled Northern Pike Spawning Areas
- 39 Northern Pike Winter Rescue Sites

The commercial fishing industry now has taken over the responsibilities previously carried out by the rough fish removal crews. The industry is comprised of ten separate subdivisions, ranging from Live Bait to International Commercial Fishery. The industry harvest from state waters is valued at \$23 million and involves 3,000 participants.

The lake and stream survey program, creel survey program and the dissolved oxygen sampling program are highly visible field programs. They also are indispensable for a continuing inventory effort to update massive long-term data on Minnesota waters for timely management decisions.

Fisheries research continues to be an integral part of Minnesota's management program. Ten field biologists, two staff program supervisors and a research manager anticipate and provide data regarding the value of innovative management techniques for fisheries management.

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 private aquatic vegetation control and modification of the current or cross-section of the beds of public waters, and through coordination with the U.S. Department of Transportation, U.S. Corps of Engineers, the Minnesota Environmental Quality Board, and the 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 area.

Land Acquisition

Acquisition of land by the Fisheries Section 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. Additionally, some acquisition effort has been needed for lake accesses on Metropolitan area lakes.

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 also 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).

A total of 95 parcels on 49 miles on 40 streams, 3 parcels on 3 spawning sites and 4 parcels on 3 rough fish control sites have been purchased. A total of 65 parcels are in the process of appraisal and negotiation. Among these are: 40 parcels of 18 miles of 20 streams, 5 parcels on 5 spawning areas, and 5 parcels on 5 sites for rough fish control.

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 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 passage for adult trout and salmon, thereby providing more stream length for spawning for adult trout and salmon. This provides more stream length for spawning and fishing.

Work was carried out on seven different anadromous streams, which benefited seven miles of stream. Work was done on 14 different inland streams, which benefited 27 miles of stream.

Development (Contract Construction)

Three 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.

Development (Fisheries Construction)

The Fisheries construction crew made major repairs and improvements at two trout rearing facilities and one walleye spawn-taking site. Two emergency repairs were made at outlet structures (a dam and a fish barrier) on two lakes. Rough fish screens and barriers were improved at five sites. Facilities for rearing and rescuing northern pike were improved at six locations.

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 combinations. 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 to supply state agencies. This has limited the rehabilitation program because of the logistics problem in the case of treating remote lakes with the use of rotenone, the alternate, but more bulky chemical. Two warmwater lakes with areas totaling 68 acres, and four trout lakes totaling 50 acres were treated during the Biennium. These projects were reimbursed 75 per cent by the U.S. Fish and Wildlife Service, under provisions of the Dingell-Johnson Fish Restoration Act.

Lake and Stream Surveys

An extensive program of surveys and inventories of fishing waters must be maintained to provide current information on the status of fish populations and the condition of habitat, in order to form the basis for distribution of the management effort. Information is collected on the physical, chemical and biological characteristics of the waters; as well as detailed information on the species composition, relative abundance and age and size distribution of the fish population.

A total of 1,843 lakes were examined for some fish management concern. A total of 399 of these involved dissolved oxygen levels during critical periods of the year. Stream surveys in this same period totaled 221.

Fishing creel surveys were conducted to determine fishing pressure, harvest, catch rate and size class distribution of the catch for the principal gamefish species on lakes and streams. These surveys aided in formulating fish management

plans and to augment continuing management on Lake of the Woods, Lake Mille Lacs, Nest Lake, the St. Louis Estuary, and 15 stream trout lakes in the Grand Rapids area. Partial creel surveys were conducted on 38 Metro area lakes, 26 North Shore streams, 42 Hutchinson area lakes and 15 Waterville area lakes.

This work is reimbursed 75 per cent by the U.S. Fish and Wildlife Service, under provisions of the Dingell-Johnson Fish Restoration Act.

Fish Production and Distribution

A total of 635,424,360 fish were stocked during the Biennium. Most of these fish were produced in state rearing facilities, with some augmentation from federal hatcheries. Most significant of these contributions were 36,830 catfish for inland lakes and streams and 262,900 lake trout for stocking in Lake Superior.

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

<u>Species</u>	<u>Adults</u>	<u>Yearlings</u>	<u>Fingerlings</u>	<u>Fry</u>
Walleye	13,162	268,527	3,903,981	619,978,198
Northern Pike	115,326	146,616	2,535,342	78,720
Muskellunge	439	7,539	10,626	
Largemouth Bass	38,915	2,234	515,724	90,000
Smallmouth Bass	42	52	27,667	
Channel Catfish		9,730	491,332	
Flathead Catfish			29,170	
Crappie	102,789	60,084	30	
Bluegill	227,014	81,606	11,590	
Perch	55,620	158,186	10,205	
Brown Trout	3,068	319,737	115,227	175,000
Rainbow Trout	41,943	491,661	421,439	
Brook Trout	5,022	39,997	243,842	253,605
Lake Trout		636,261	116,862	
Rainbow Trout (SST)				2,296,200
Chinook Salmon			664,936	504,601
Atlantic Salmon		17,952		
Splake			106,541	
Totals	603,340	2,240,182	9,204,514	623,376,324

Fall run chinook salmon eggs were obtained from the state of Michigan in October, 1980 and hatched in the French River facility for stocking in ten North Shore streams. In May, 1982 the Fisheries Section acquired Atlantic salmon from the state of Maine. These fish will be planted (to evaluate them on their availability to the angler) in tributary streams of Lake Superior.

An uncounted number of northern pike were released from 81 natural spawning areas which receive management and protection from the Section of Fisheries.

Several major improvements and repairs were made at three trout rearing facilities. The new "Olson Incubator" will be activated in 1983. This revolutionary new incubation system for fish eggs was developed by a DNR research biologist at Detroit Lakes Area Fisheries Headquarters. It utilizes the recirculation of water: thereby requiring much less total water, less energy to heat and move water, more accurate counts of fry and decreased problems with iron-rich water. The unit's portability will enhance the stocking of fry.

It is anticipated that this incubator will eliminate the need for additional hatchery construction.

Commercial Fisheries

Minnesota's commercial fishing industry is comprised of ten separate discrete fisheries units. They are, by name: Live Bait, Interstate, Inland, Lake Superior, Turtles, International, Inland Mississippi River, Frogs, and Mississippi-Minnesota River Set Lines. In 1981, legislative action repealed the Mussel and Clam license requirement.

Fish production by commercial fishermen during the Bien-nium totaled about 7,500,000 pounds, valued at \$23,000,000. This involved 3,000 participants who paid \$75,000 in license fees.

Information from reports submitted by commercial fishermen is used by Fisheries managers when regulations or management decisions are formulated. Thus, fish are harvested for personal gain, while benefiting management decision making and the fish-food consumer.

The following statistics are provided for each of the individual commercial fishing units.

Live Bait

This industry provides live bait (minnows, leeches, crayfish, etc.) for the 2.5 million sports anglers fishing the waters of the state. The bait is produced by harvesting natural ponds; and intensive culture under the authority of private hatchery licenses.

Number of licensed participants:	<u>1981</u>	<u>1982</u>
Retailer	1,251	1,256
Dealer	399	423
Helper	819	854
Exporter	39	40
Non-resident Hauler	16	19
License receipts	\$ 53,198	\$ 63,721
Gallons of minnows harvested	204,029	358,322
Gallons of minnows exported	148,281	213,929
Gallons of leeches harvested	13,138	11,507
Gallons of leeches exported	1,320	2,741
Estimated value of catch	\$20,885,646	\$23,005,340

Contact with the commercial fishing industry is maintained through participation in its annual meeting, and summarizing annual reports submitted by each harvester. In 1980, the Minnesota Live Bait Industry Assessment Study (Investigational Report No. 367) was published. It documents three years of data in a comprehensive survey of the live bait industry.

Investigational Report No. 375, "Management of Ponds for Bait-Leeches in Minnesota" was published in 1982. This three-year study documents the life history of the leech (Nepheleopsis obscura, Verill) as found in ten natural ponds of west central Minnesota. Pond size, configuration, depth, aquatic plant life, aquatic animal life, watershed, water quality, water chemistry and water fertility were considered in evaluating natural pond production of leeches.

Interstate

This fishery comprises boundary waters between Minnesota and Wisconsin. All production comes from the Mississippi River. There were no requests for licenses to fish the St. Croix River.

Number of licensed participants:	<u>1981</u>	<u>1982</u>
Fishermen	143	157
Helpers	58	67
License receipts	\$ 5,596	\$ 6,020
Pounds of fish harvested	586,364	381,749
Estimated value of catch	\$ 68,420	\$ 58,051
Permits issued	2	2

Contact with the fishery is maintained by summarizing monthly reports submitted by each fisherman. Periodic meetings are held with Wisconsin authorities, to evaluate present regulations and recommend changes. The fishery does not have an organization.

Inland

The fishery (formerly contracted) harvests the less desirable species of fish from all inland waters of the state. Fishermen are assigned a given area and are expected to provide the fish removal effort on lakes within that area. State crews can remove fish from lakes of no interest to commercial fishermen.

Revenues received from State	<u>1981</u>	<u>1982</u>
Sales of fish	\$ 8,373	\$ 5,831
Number of licensed participants:		
Fishermen	26	24
Helpers	202	194
License receipts	\$ 4,467	\$ 4,461
Pounds of fish production	\$ 5,419,406	\$ 5,005,617
Estimated value of catch	\$ 533,022	\$ 528,623
Permits issued	56	57

Contact with the fishery is maintained through participation in the annual membership meeting, and summarizing the daily haul reports. An annual meeting is held between Minnesota and South Dakota agency personnel to review and recommend changes in fish management issues on border waters.

Lake Superior

This fishery is restricted to those waters of Lake Superior under the jurisdiction of Minnesota.

Number of licensed participants:	<u>1981</u>	<u>1982</u>
Fishermen	42	46
Helpers	25	41
License receipts	\$ 2,996	\$ 3,068
Pounds of fish production	\$ 513,949	\$ 652,956
Estimated value of catch	\$ 174,834	\$ 185,292
Permits issued	12	20

Contact is maintained with the fishery through participation in the annual membership meeting and summarizing monthly reports submitted by each fisherman. Cooperative efforts are continuing with commercial fishermen in lake trout assessment, gear investigation and gear placement. The sport fishing harvest of lake trout is increasing, while natural recruitment has not adequately responded to stocking efforts.

Turtles

This fishery is comprised of turtle (primarily snapping turtle) harvesting by licensed individuals operating state-wide.

Number of licensed participants:	<u>1981</u>	<u>1982</u>
Turtle harvesters	69	64
License receipts	\$ 1,725	\$ 1,600
Pounds production	\$ 55,808	\$ 45,523
Estimated value of catch	\$ 27,904	\$ 22,761

Contact with the fishery is maintained by summarizing reports submitted by each harvester. Interest in providing protection for Minnesota's reptiles and amphibians is increasing.

International

This fishery includes the boundary waters between Minnesota and Canada. Commercially fished waters are restricted to Lake of the Woods; Rainy and Namakan lakes; and Sand Point Lake (not fished).

<u>Lake of the Woods:</u>	<u>1981</u>	<u>1982</u>
Number of licensed participants:		
Fishermen	13	13
Helpers	14	14
License receipts	\$ 1,335	\$ 1,060
Pounds of fish production	1,017,407	889,421
Estimated value of catch	\$ 276,773	\$ 367,080
Permits issued	2	3

<u>Rainy Lake:</u>	<u>1981</u>	<u>1982</u>
Number of licensed participants:		
Fishermen	5	5
Helpers	7	4
License receipts	\$ 335	\$ 320
Pounds of fish production	112,392	102,767
Estimated value of catch	\$ 48,705	\$ 37,644

<u>Namakan Lake:</u>	<u>1981</u>	<u>1982</u>
Number of licensed participants:		
Fishermen	2	2
License receipts	\$ 105	\$ 110
Pounds of fish harvested	4,798	10,799
Estimated value of catch	\$ 888	\$ 2,190

Contact with this fishery is maintained through summarization of monthly reports submitted by each fisherman. Because the walleye is a commercially harvested fish in these lakes, a conflict between commercial and sport fishing factions has developed. By legislative direction, an agreement was reached whereby both parties will abide by recommendations of the Department of Natural Resources, to be formulated after a detailed three-year study. The data from this study will be analyzed, and recommendations made in 1985.

Inland Mississippi River

This fishery is restricted to that portion of the Mississippi River that lies between St. Anthony Falls in Minneapolis to the confluence of the St. Croix River near Hastings.

Number of licensed participants:	<u>1981</u>	<u>1982</u>
Fishermen	2	2
Helpers	4	4
License receipts	\$ 100	\$ 110
Pounds of fish harvested	73,740	27,300
Estimated value of catch	\$ 5,583	\$ 4,611

Contact with this fishery is maintained through summarizing annual reports submitted by the fishermen. The license for one 100-hook set line was deleted by the 1981 Legislature.

Minnesota-Mississippi River Set Line

This fishery is restricted to one 10-hook set line per fisherman in the rivers from Mankato on the Minnesota River to the confluence of the Mississippi River, and from St. Anthony Falls on the Mississippi River to the confluence of the St. Croix River.

Number of licensed participants:	<u>1981</u>	<u>1982</u>
Fishermen	1	0
License receipts	\$ 10	0
Pounds of fish harvested		Not Reportable
Estimated value of catch		Not Reportable

No contact with this fishery is attempted. It is not considered a viable commercial fishery.

Frogs

The fishery is statewide and controlled by Commissioner's Order. However, no frogs may be taken for commercial purposes other than bait. This order was put into effect following the disastrous frog die-off of 1974. Since that time, frog population checks have been made. In 1982, the first significant evidence of frog population rebounding was seen. Reduction of frog harvest will remain in effect until the population has stabilized.

Mussels and Clams

In 1982, there have been reports of clam harvest for use in the cultured pearl industry of the Orient. This harvest may approach 100,000 pounds. The fishery is being watched for evidence that licensing should be recommended.

Private Hatchery Operations (other than minnow)

These operations are conducted by individuals involved in spawning, hatching and/or rearing fish for private consumption or utilization. A variety of fish species (walleye, northern pike, largemouth bass and trout among others) are eligible for production; however, trout are far and away the most popular. More than two-thirds of these licensees are hobby or one-pond operators. Of the remaining eight, one operator produces more than half of the total production reported.

Number of licensed participants:	<u>1981</u>	<u>1982</u>
Operators	38	44
License receipts	\$ 950	\$ 1,100
Pounds of fish production	122,588	154,432
Estimated value	\$ 61,294	\$ 92,659.20
Fish transportation permits	80	125

Contact with this industry is maintained through summarizing annual production reports, pond and hatchery inspections, and issuance of fish transportation permits.

Fisheries Research

During the Biennium, the Research Unit initiated five management oriented projects: Evaluation of Valley Creek rainbow trout in other southeastern Minnesota trout streams; anadromous creel census of north shore streams; evaluation of three strains of lake trout in inland lakes in northeastern Minnesota; evaluation of trout stream habitat management in southeastern Minnesota; and creel census in the St. Louis River.

Five completion reports were published in the Investigational Report Series. They are as follows: "Comparison of marks on scales and dorsal spine sections as indicators of walleye age" (Number 371); "Evaluation of Madison, Donaldson and Kamloops strains of rainbow trout in Lake Superior" (Number 372); "Experimental incubation of fish eggs in a moist air environment" (Number 373); "The effects of water levels and other factors on walleye and northern pike reproduction and abundance in Rainy and Namakan Reservoirs" (Number 374); and "Management of ponds for bait-leeches in Minnesota" (Number 375).

Also edited and published were three reports in the Fish Management Report Series. They are as follows: "A water surface use study of 21 metro area lakes" (Number 22); "A quantitative roving creel census and angler profile of the 1979-1980 winter fishing season on the St. Louis estuary" (Number 23); and "A water surface use of 48 metro area lakes" (Number 24).

There were 13 research projects in progress, as follows:

- * Shoreline seining for 0-age largemouth bass as a method of predicting subsequent year-class abundance at recruitment to the anglers catch.
- * Sport fishery of Lake Winnibigoshish and connected waters.
- * Evaluation of a continuous walleye and sauger sports fishery on the Mississippi River.
- * Feeding interactions of northern pike and walleye and their influence on the prey resource.
- * Evaluation of flathead catfish as a predator in Minnesota lakes.

- * Identify principal muskellunge spawning area(s) in Leech Lake by use of radio telemetry.
- * Evaluation of smelt as forage fish in inland lake trout lakes.
- * Development of effective lake trout stocking procedures.
- * Field evaluation of three strains for hatchery reared trout.
- * Evaluation of spring-chinook salmon as a sport fish in Minnesota waters of Lake Superior.
- * Reduction of predation on stocked fingerlings rainbow trout in lakes, through use of alternative prey.
- * Factors affecting brown trout reproductive success in southeastern Minnesota trout streams.
- * Evaluation of lake aerations technique for winterkill prevention.

In addition, five staff reports were written, dealing with a range of topics; from Lake of the Woods commercial fishery, to the status of the northern pike.

Approximately 20 per cent of the Research Unit's time was spent in directly assisting management. This included design, implementation and analysis of creel censuses; sample design and analysis for management projects; and editing and publishing reports in the Fish Management Series.

The mailing lists for all Section of Fisheries publications were upgraded. Currently, a letter listing recent publications is sent to all recipients on the mailing list (approximately 400), so that they may request those in which they are interested. This has helped to reduce the required number of copies of publications.

An intensive acid rain monitoring program on lakes was initiated in 1981, and continues through 1982. Fish population, plant community, water quality, and contaminant levels are being monitored on select lakes in areas geologically sensitive to acid deposition.

An acute bioassay was conducted on one sensitive and one control lake to determine the effects of snow melt on rainbow trout and fathead minnows. A report to the Legislative Committee on Minnesota Resources, on acid precipitation in Minnesota, was co-authored with the Minnesota Pollution Control Agency and the Minnesota Department of Health.

Participation on the Acid Rain Task Force and Technical Review Committee continues.

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WILDLIFE MANAGEMENT

The wildlife management program was expanded in function at the beginning of Fiscal Year 1982 with the inclusion of the DNR Bureau of Planning's Natural Heritage Program, and the Division of Parks and Recreation's Scientific and Natural Areas Program.

The Natural Heritage Program (NHP) conducts inventory and research, and catalogues information on Minnesota's native plant communities and rare plants. Technical expertise on the management of plant communities is provided, as well as aid given in the selection of Scientific and Natural Areas. The NHP also administers the Native Prairie Tax Credits, the Ginseng Harvest Program and the State's endangered plant designations.

Scientific and Natural Areas are responsible for the protection and perpetuation of the natural diversity of the State. Scientific and Natural Areas insure protection of natural entities: such as rare and endangered wildlife and/or plants, rare plant communities, land forms or geologic features, for educational, scientific, and nature appreciation purposes for present and future generations.

Wildlife management and operations involves numerous activities and programs to preserve, maintain and enhance wildlife resources and their habitats on public and private lands; for public use, recreation and enjoyment. Primary activities include the acquisition and management of State Wildlife Management areas (WMA's); conducting wildlife census and surveys, and wildlife research; developing hunting and trapping regulations; and environmental review. Other notable programs are: the nongame programs to inventory, plan, research, manage habitat, species restoration and provide information on non-hunted wildlife; the State's Migratory Waterfowl Stamp; Deer Habitat Improvement; Wildlife Management Area Inventory; and Wildlife Management Area Betterment.

During FY 82, a total of \$7,826,800 was spent for various wildlife management activities. During FY 83, a total of \$8,175,500 is projected. These costs do not show general revenue bonding money used in the WMA acquisition and betterment programs.

Of this amount, \$6,943,000 and \$7,350,900 were dedicated game and fish funds for FY 82 and FY 83, respectively.

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 520,000 acres have been acquired in 950 Wildlife Management areas across the state.

During FY 82 and FY 83, the Section of Wildlife purchased 9,900 acres of wildlife lands at a cost of \$3.5 million. Wildlife lands were acquired in 39 Wildlife Management areas in 31 counties. A major portion of the funds for acquisition was derived from a general revenue bonding program entitled Resource 2000. During FY 82 and FY 83, a total of \$2 million was appropriated for wildlife land acquisition. Additional acquisition funds include \$685,000 annually from the small game license surcharge.

Gift Program

A total of 58 acres were received as gifts during Fiscal Years '82 and '83, for use as wildlife areas. Seventy-six acres in easements also were obtained.

General Management and Operations

Wetland Wildlife

To maintain managed wetlands in one to one ratio of vegetation to water, water level management techniques were incorporated on 78,656 acres of public lands and waters in 1981 and 79,167 acres in 1982.

A total of 206 small wetlands were constructed during 1981 and 1982. These wetlands were created by digging dugouts, level ditches and canals; and by reclaiming small drained pot-holes. Artificial nesting structures were also created, with 1,159 installed and maintained in 1981, and 210 in 1982.

Farmland Wildlife

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

	<u>1981</u>	<u>1982</u>
New Woody Cover Plantings	63	32
Wildlife Food Plots	814	844
Artificial Feeding Sites	120	120
Development and Improvement of Nesting Cover	10,255 acres	10,677 acres

Forest Wildlife

Forest wildlife improvement is oriented primarily toward the creation of diverse forest plant communities of varied age classes on public lands. The primary tool is forest disturbance by mechanical means; such as logging and cutting, as well as controlled burning to regenerate forest growth. During 1981, a total of 16,056 acres of young successional growth was created on 447 sites. In 1982, a total of 6,510 acres were disturbed on 312 sites.

Creating and maintaining forest openings is a key to maintaining and creating greater forest diversity. A total of 653 openings were created and maintained in 1981, and 1,410 in 1982.

Food plots were also established for deer and other forest wildlife. In 1981, a total of 102 food plots were established, and 150 were created in 1982.

Management

Besides the management of terrestrial and aquatic habitats, much effort is required to protect State Wildlife Management areas 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)	2,069	1,256
Public Use Facilities (number)	545	526
Noxious Weed Control (acres)	9,467	11,464

Boundary marking includes the signing of wildlife areas, and fencing as needed to mark and protect these lands.

Public use facilities include parking lots; access and logging roads and trails; as well as hunter shooting blinds.

Noxious vegetation control on state lands is required by state law, where the primary weeds controlled are thistles.

Wildlife Development

State Migratory Waterfowl Stamp

During each year of the Biennium, the sum of \$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 wildlife management areas, and lakes designated for wildlife management purposes.

Newly constructed wetlands completed during FY 81 and FY 82 were as follows:

Jenson WMA, Grant County - 15 acres

Nereson WMA, Roseau County - 500 acres

Grey Eagle WMA, Todd County - 37 acres

Ivanhoe WMA, Lincoln County - 35 acres

Red Lake WMA - 2 @ 450 acres

Lac qui Parle WMA - 2 @ 105 acres

State Forest Land, Beltrami County - 8 @ 79 acres

County Forest Land, Crow Wing County - 5 acres

Winner Dam, Lake of the Woods County - 180 acres

Sugar Lake, Itasca County - 190 acres

Evergreen Pond, Koochiching County - 70 acres

Total: 1,660 acres

Other projects included the repair of outlet dams and dikes, and replacement of water level control structures on 15 wetlands totaling 11,358 acres; and the construction of 136 dugouts of various sizes. Also, a mechanical vegetation cutter was purchased for improving wetland habitat.

Betterment of Wildlife Management Areas

During FY 80-81 (\$500,000) and FY 82-83 (\$400,000) was made available for improvement of Wildlife Management areas. The expenditure of the Resource 2000 appropriation was approved by the Legislative Commission on Minnesota Resources (LCMR). The primary program emphasis was to develop the new lands purchased under the Resource 2000 acquisition program.

Efforts centered around the development and improvement of public facilities such as parking lots, accesses and walking trails. Funds were used to create wildlife nesting cover: by such means as planting lands to domestic or native prairie plants. Where appropriate, grasslands were rejuvenated by burning. In the forested wildlife areas, over-mature aspen was cut and new forest openings were created to rejuvenate wooded areas, thereby creating greater forest diversity.

New acquisitions were signed and fenced where needed. Planting of woody cover areas for winter shelter and other management techniques were undertaken. Accomplishments are included under the "General Management and Operations Section."

Other Key Wildlife Programs

Private Land Wildlife Habitat Improvement

Cost-sharing to develop wildlife habitat on private land has proven to be valuable in helping landowners develop their lands for wildlife. The following projects were completed under this program:

	<u>FY 81</u>		<u>FY 82</u>	
	No.	Acres	No.	Acres
Nesting Cover	2	13	2	10
Food Plots	286	914	268	852
Wetland Development	24	77	10	114
Woody Cover	27	53	15	30
Cost:	\$ 117,240		\$ 95,000	

Pheasant Chick Program

This program, which provided day-old pheasant chicks to outdoor organizations, was discontinued at the start of the Biennium due to high cost and minimal benefits to pheasant populations.

Wildlife Management Area Inventory

Since the start of FY 80, a total of \$205,600 has been appropriated by the LCMR to inventory the basic species cover types, and other physical and biological features of the state's Wildlife Management areas. A total of 180 wildlife areas were inventoried in FY 81; and 367 units in FY 82. A data base management system to process the information has been developed, and all units have been mapped. The inventory will be completed by the end of FY 83.

Nongame Wildlife Program

The Nongame Wildlife Program has grown considerably in this Biennium with the establishment of the Nongame Wildlife Checkoff on Minnesota's income tax forms. In 1981, a total of \$569,277,78 was received from 170,177 people. In 1982, more than \$628,000 has been received from some 196,000 citizens.

Donations received will be used to implement a comprehensive program to preserve the diversity and abundance of Minnesota's nongame wildlife resources. A plan for this comprehensive program is in preparation.

Past research projects have involved studies of piping plovers, five-lined skinks, bald eagles, and trumpeter swans; effects of aspen clearcutting on nongame birds; bluejay ecology; and great gray owls. Recent surveys have focused on Blanchard's cricket frogs, pickerel frogs, red-shouldered hawks, bats, prairie chickens, sandhill cranes, rock voles, small mammals, yellow rails, sharp-tailed sparrows, chestnut-collared longspurs, Sprague's pipits, Bairds' sparrows, and mink frogs.

Otter restoration efforts in the upper Minnesota River Valley have now been completed, with the release of 22 otters. Restoration projects are currently underway for trumpeter swans and peregrine falcons.

The Raptor Research and Rehabilitation Program at the University of Minnesota receives \$25,000 per year for their work.

The 1,300-acre Lamprey Pass WMA was acquired in 1981, partially with nongame funds, in order to preserve a large heronry.

A variety of information and education efforts are also under way to educate the public about our nongame wildlife resources, and the need to help them. Four regional nongame specialists have been hired to help with these efforts. Many of their activities will include habitat management work in coordination with county, state, and federal natural resource managers; and private citizens.

Natural Heritage Program

The Natural Heritage Program (NHP) conducts inventory and research, catalogues data in a computer-based information system, and provides technical expertise on management of Minnesota's native plant communities and rare plants. Previous to the work of the NHP there was no program or staff within the Department responsible for monitoring and/or managing this basic and important component of Minnesota's natural resources. NHP staff botanists currently provide assistance to the Department's SNA staff, nongame specialists, wildlife managers and

researchers, foresters, and park naturalists. The responsibilities of the NHP staff also include administration of plant related projects: the Ginseng Harvest Program, the Native Prairie Tax Credit Program, the designation of state endangered plants, and the selection of Scientific and Natural Areas.

In addition to working directly with DNR personnel, the NHP staff regularly provides information to the private sector and local governments, for use in planning development projects. In the past there has been a lack of: sufficiently detailed biological information on natural features; a centralized location for storages and continuous update of the information; and a cost-effective approach to analysis and retrieval of the information. The NHP provides objective analysis of rare and unique ecological resources. Data is made available for evaluation of alternative plans (especially in routing, siting, and permitting decisions) before commitments are made.

The NHP responded to more than 230 user requests in FY 82, and 250 in FY 83. These projects included: assistance on a forestry-soils project; evaluation of candidate hazardous waste sites, routine review of land exchange proposals and environmental review projects, and survey of potentially significant natural areas. In relation to other responsibilities, NHP staff has initiated the Minnesota Natural Heritage Register of public lands; and coordinated the Endangered Species Technical Advisory Committee, in compliance with the new changes in Minnesota's Protection of Threatened and Endangered Species law.

Scientific and Natural Areas

The Scientific and Natural Areas (SNA) Program, through the establishment of SNA's, protects and perpetuates the natural diversity of the State; including rare and endangered species, plant communities and geologic features.

Twelve new units were designated during FY 81. Eleven of these were acquired via a free lease from the Nature Conservancy. Acquisition was completed on the remaining unit, Boot Lake in Anoka County; assuring the protection and perpetuation of rare species such as the blanding's turtle, water willow (a rare plant), and an oak forest plant community. Only one unit was acquired in FY 82: Kellogg-Weaver Dunes, 182 acres of sand dune prairie in Wabasha County. Kellogg-Weaver Sand Dunes contains an excellent sand prairie plant community -- habitat for a number of rare species of plants and animals. To date in FY 83, the following three new SNA's have been established, all on lands owned by the state and/or the Natural Conservancy (TNC): Hemlock Ravine (formerly a part of Jay Cooke State Park) in Carlton County, Itasca Wilderness Sanctuary (in Itasca State Park), and Bluestem Prairie (Buffalo River State Park and TNC). In addition, the exchange of state land for critical private or county lands was used during the Bienium to protect critical tracts of land.

The acquisition of critical tracts encompassing habitat for piping plover (a threatened shorebird), calcareous fen plant communities (rare throughout the United States), and other rare species such as golden saxifrage (a disjunct species from the Rocky Mountains) continues to be pursued to insure that species and communities are not destroyed.

The Biennium also saw management plans developed for 11 units, detailing the management considerations for resource perpetuation and users of the units. These plans insure that appropriate management of each site and its resources takes place. Ultimately, plans for the management of all SNA's (25 sites at present) which protect everything from rare orchids, remnant prairies, and big woods to fens, will be developed.

Hunting Seasons

Deer

Deer firearms hunters again had an opportunity to choose their own particular hunting season within a set framework.

The registered harvest for the 1980 and 1981 hunting seasons are noted below:

	1980		1981	
	<u>License Sale</u>	<u>Harvest</u>	<u>License Sale</u>	<u>Harvest</u>
Deer Firearms	346,894	77,097	375,542	108,135
Archery; Deer	43,333	3,641	51,262	5,535
Muzzleloader; Deer	2,100	294	2,238	385

Moose

The sixth moose hunt was held in the fall of 1981. In northwestern Minnesota there were 12 zones, with 505 permits issued to parties of four hunters. A total of 455 moose were taken. Fourteen zones were established in the northeast; the harvest was 309 moose from 375 permits.

Waterfowl

The duck harvest totaled 1,199,000 in 1980, and 1,167,000 in 1981 -- a decrease from the previous two years. The harvest of Canada geese also decreased; with 72,000 taken in 1980, and 71,000 in 1981.

Turkey

In 1978, the first spring hunting season for turkey was held. Drawings were required for the issuance of a limited number of permits.

	<u>Harvest</u>	<u>Permits</u>
1982	106	2000
1981	113	1500
1980	98	1200
1979	116	840
1978	94	420

Upland Game

	<u>1980</u>	<u>1981</u>
Pheasants	466,000	573,000
Ruffed Grouse	941,000	576,000
Sharp-tailed Grouse	56,000	34,000
Hungarian Partridge	101,000	110,000
Squirrels	514,000	625,000
Rabbits, Hares	587,000	417,000
Raccoon	88,000	136,000
Fox (Red and Gray)	31,000	41,000

Trapping

	<u>1980</u>	<u>1981</u>
Muskrat	1,419,000	989,000
Mink	96,000	76,000
Beaver	73,000	46,000
Raccoon	61,000	72,000
Fox (Red and Gray)	47,000	58,000

License Sales

	<u>1980</u>	<u>1981</u>
Sportsmens Individual	45,692	58,428
Sportsmens Combination	58,073	73,520
Small Game	249,659	229,749
Small Game, Senior Citizen	10,997	11,138
Small Game, Nonresident	<u>4,059</u>	<u>4,271</u>
Total Small Game Licenses	368,480	377,106
Trapping	24,691	23,679
State Migratory Waterfowl Stamp	149,483	125,871

Wildlife Research, Census and Survey

It is the responsibility of the Wildlife Populations and Research Unit to provide information for making management decisions through field research, and through the analysis and interpretation of the findings from wildlife census and survey activities.

Twenty-five research projects were under way in the Farmland, Forest and Wetland Research groups. Nineteen census and survey projects provided data each year on the status of various wildlife species, for use in setting hunting and trapping seasons and for making other management decisions.

Findings from research and census/survey projects are reported in the "Minnesota Wildlife Research Quarterly", and in outside publications. A "Wildlife Populations and Research Unit Project Descriptions" book was published in FY 82. This publication contains descriptions of currently active research, census, and survey projects. The descriptions are a review of present Wildlife Populations and Research Unit activities.

Farmland Wildlife

The importance of deer populations in the farmland area of Minnesota has increased greatly in recent years. Presently, nearly 50 per cent of the firearms deer harvest and more than 80 per cent of the registered archery kill comes from the farmland area. Accordingly, the Farmland Group has a substantial involvement in a wide range of deer research and population monitoring work. Research activities during the Biennium included work on evaluating farmland deer population counts and

trend indicators, evaluating and monitoring mortality factors, and a study aimed at establishing fawn mortality and net productivity. The value of special roadside reflectors, as a means of reducing deer-vehicle collisions, is being studied. The potential of "deer-proof" fences, equipped with special one-way gates to allow deer trapped on Interstate Highway corridors to escape, is also being investigated.

Two studies on the potential of managing roadsides for wildlife were concluded in FY 82. Other research being continued by the Farmland Group involves monitoring the population dynamics and transplant success of wild turkeys; the value to wildlife of cost-shared ten-row shelterbelts, and farmer attitudes about such plantings; and the effects of trapping on muskrat populations.

Annual surveys include biological collections from dead deer, monitoring the condition and age of dead deer, spring turkey gobble counts, and August roadside counts for selected wildlife species.

Forest Wildlife

The Forest Wildlife Group has a substantial involvement in monitoring population levels and status of a variety of forest species.

The Farmland Group coordinates the collection of and analyzes a variety of data sets pertaining to forest deer. From spring pellet counts, information is obtained on deer population levels and trends for various management units. A number of factors are integrated into a single numerical rating or Winter Severity Index (WSI). The WSI plays an important role in assessing winter conditions for white-tailed deer. By collecting teeth from hunter-killed deer, researchers obtain data on the sex and age structure of the harvest. Such information is used for determining mortality and survival rates, and for population modeling to assess population fluctuations and the factors responsible for the changes.

The nutritional value of deer browse is being monitored on a continuing basis to document seasonal and annual changes in important species of deer browse, and to relate such changes to deer physiology.

Aerial counts of moose are conducted each winter in northeast and northwestern Minnesota. These counts provide an annual estimate of moose populations, thus providing valuable information on long term trends in moose abundance.

There is a substantial and growing need to document predator and other furbearer population trends, to provide a sound biological basis for management, and for answering public inquiries on the status of these species. A predator and scent

post survey was initiated in 1976. The various species that visit numerous stations are indicated by tracks in the sifted earth. The procedure, while not giving direct population estimates, nevertheless provides much valuable data on species distribution and indices of abundance.

Findings from three major studies are being evaluated and prepared for publication: (1) relationship of white-tailed deer to ecological types in northern Minnesota; (2) ecology of forest predators; and (3) sharp-tailed grouse habitat development investigations.

A major research effort on black bear is being undertaken to monitor bear population densities, using bait station routes, the impact of the bear guides, and the effect of hunting pressure on kill rates; and to assess survival, productivity and physiological status of bear populations. Bear teeth are being collected for determining the age structure of the population, for use in developing a population model for Minnesota's bear population.

The white-tailed deer is the primary prey of the timber wolf in Minnesota. The whitetail is important to more than 300,000 deer hunters in the state, plus the more numerous non-hunting public. Data are needed on wolf densities, productivity, mortality, and the factors causing mortality from areas of northern Minnesota where both wolves and deer exist in good numbers. The need for such information is immediate, because of steps now being taken by the U.S. Fish and Wildlife Service to return management of the timber wolf to Minnesota. The Forest Group is conducting a deer-timber wolf interaction study which is funded with Federal money under the Endangered Species Act.

Wetland Wildlife

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 of banding data in recent years 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 since then, under standardized conditions. Results of these counts form a valuable data base on changes in abundance of various waterfowl species nesting in the state.

Minnesota is the principal production state for the ring-necked duck. This species is usually the third or fourth most abundant breeding duck in the state, and the second or third most common duck taken by hunters.

The Wetland Group is conducting research to identify age-related differences in breeding behavior, to determine annual productivity of various ring-neck female age classes, and to determine the relative contribution of homing and pioneering females to population productivity. Further work is under way to determine seasonal food needs of breeding ringnecks.

Wood ducks, common goldeneyes, hooded mergansers, and common mergansers are important cavity-nesting waterfowl found regularly in Minnesota. Present state and federal breeding pair surveys are largely aerial censuses of the prairies and prairie-parklands. Thus, these surveys exclude most of the breeding range of the cavity-nesting species. Checks of nest boxes may provide the most reliable means of determining abundance of these cavity nesting ducks, and research is under way to determine if the procedure has merit under Minnesota conditions. Routine checks of waterfowl nest boxes suggest that common goldeneyes and hooded mergansers may be experiencing reproductive problems in north central Minnesota. An investigation is being conducted to determine the cause of this apparent reproductive problem. The objectives are to establish baseline levels of contaminants, and to study pesticide and heavy metal contamination and their possible relationship to reproductive performance in these two species.

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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:

- * Biology Laboratory
- * Chemistry Laboratory
- * Monitoring and Control Unit: aquatic nuisance control, pollution investigations, power plant monitoring, lake aeration
- * Surveys and Review Unit: ecological investigations, river surveys, environmental review
- * Special Projects Unit: lake mapping, data processing and analysis, statistics, instream flow analysis, special investigations

The Section is designed to provide and develop expertise in the various disciplines and activities in which it is involved. The units are flexibly organized to permit use of personnel, as needed, in activities or projects outside their "home" unit. In this way Ecological Services is able to fully utilize a person's background, capabilities and experience.

Surveys and Investigations

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

Fish and wildlife habitat evaluation studies were conducted and/or continued on 25 major proposed development type projects of the U.S. Corps of Engineers, U.S. Department of Transportation, U.S. Soil Conservation Service, local governments and private firms.

Reviews, comments and recommendations were made on 239 environmental documents of other agencies.

Fish and wildlife surveys were conducted on 302 miles of major rivers: Ottertail, 25 miles; Minnesota, 250 miles; Mississippi, 27 miles. An investigational report for the Roseau River survey was completed and reports are in progress for the Ottertail, Minnesota and Red Lake rivers.

About 500 U.S. Corps of Engineers permit applications were received and coordinated with DNR area fish and wildlife managers for their information and involvement.

Game lake surveys and maps were completed for 21 lakes located in the Rice Creek and Lake Minnetonka watersheds.

A partial game lake survey, electrofishing survey, and benthos survey (sampling of aquatic life on stream or lake bottoms) was done in the proposed Duluth Harbor dredge disposal sites. Electrofishing was also carried out to obtain fish for tagging, as part of a fisheries study of the Duluth Superior Harbor.

Fish collections were made on the Mississippi River to provide specimens for PCB and heavy metal analysis by the Pollution Control Agency, and the Metro Waste Commission.

Monitoring and Control Unit

The following activities were carried out during the Bien-nium, by the Monitoring and Control Unit:

A total of 933 aquatic nuisance control permits were issued 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 federal Environmental Protection Agency. A total of 105 aquatic herbicide applications were monitored and/or supervised; 170 proposed treatment areas were inspected; and 75 investigations were made regarding herbicide misuse complaints.

A total of 189 pollutional spills were reported to the Section. Sixty-four of these were investigated, of which 38 included fish and wildlife kills. Fifty-seven cases of fish and/or wildlife kills resulting from natural causes were investigated. Investigations of pollution-caused kills resulted in settlements and payments (by offending parties) to the Game and Fish Fund, totaling \$36,808.

The monitoring of fish populations and fishing success continued at the Prairie Island nuclear power plant on the Mississippi River, near Red Wing. Interviews were conducted with 8,917 anglers to determine angling success. Fish populations were monitored through use of 157 gillnet and trapnet sets, 48 seine hauls, 30 hours of electrofishing, and three hours of trawling. Loss of fish through impingement and entrainment was monitored, resulting in payments of \$29,881 to the Game and Fish Fund.

The annual monitoring of water quality on 15 representative fish lakes around the state continued in the first year of the Biennium, but was discontinued because of personnel shortages. Present plans include continuation of the program at a future date.

Four hundred fish specimens, needed for chemical analysis by the various involved state and federal agencies, were collected.

DNR operational policy requires approval by the Commissioner of any pesticide applications by Department personnel, on sites 40 acres and larger. The unit supervisor reviewed 290 such applications for the Commissioner during the Biennium; the majority for conifer release or site preparation by the Division of Forestry.

A staff member represented the DNR at regular meetings of several "pesticide related" committees -- including the Governor's Regional Interdisciplinary Pesticide Council; Minnesota Pesticide Impact Assessment Team; Metropolitan Mosquito Control Advisory Committee; and State Pesticide Purchasing Standards Committee.

Fifty-four permits were issued for installation and operation of lake aeration systems, primarily for prevention of winterkill of fish.

Special Projects Unit

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

A total of 139 lakes (comprising 30,122 acres) were sounded, and 130 lake maps prepared.

Seventy-three benthos (bottom fauna) samples were collected and/or processed from the Minnesota and Ottertail rivers, and Duluth Superior Harbor; 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.

Increasing use was made of the computer terminal in the Section; putting lake, stream and water chemistry data into the University of Minnesota computer for analysis and retrieval for various research and management purposes. The data relating to lakes was processed into useable form. The aquatic plant data from some problem lakes, and water quality monitoring lakes, was entered and summarized. Additional information on lakes and streams will be included with the data stored on tapes. Several summaries from the data stored on tapes were provided to the Section of Fisheries.

Evaluation of the fish populations and habitat in stream diversions at Reserve Mining's Mile Post 7 project was continued, and final plans developed for installation of stream improvement structures.

One staff member was assigned to represent the DNR's Fish and Wildlife Division in working with the U.S. Corps of Engineers, U.S. Geological Survey, and the U.S. Fish and Wildlife Service (Instream Flow Group, Fort Collins, Colo.); to determine protected low flows for fisheries needs in the Mississippi and Minnesota rivers. Protected flow studies and recommendations were also made; for the Clearwater, Kettle, Blue Earth and Cannon rivers.

Technical assistance relating to lake and stream information was provided to members of the staff, other bureaus and agencies, and private citizens.

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.

Laboratory Services

Laboratory work carried out during the Biennium included the following:

Biology Laboratory

- * A total of 14,089 various examinations and tests (including autopsies) were performed on 4,671 fish and wildlife specimens.
- * A total of 189 technical memoranda and reports were prepared covering results of laboratory tests, investigations, and prescriptions.
- * Assisted personnel of the Division of Enforcement in the investigation and analysis of forensic evidence in the prosecution of 41 game and fish violation cases and the laboratory supervisor was subpoenaed on seven occasions in court.

- * Coordinated fish health monitoring practices at all State Fish Hatcheries, and supervised fish health clearance requirements for 60 Minnesota DNR Game Fish Transportation and Importation permits.
- * Participated in Great Lakes Fish Disease Control Committee Workshops, and prepared an annual report on the health status of Minnesota fish stocks and trout hatchery disease classifications, as required of members of the committee.
- * Worked on and collaborated with others on fish diseases and anomalies (lymphosarcoma in northern pike, myofibroganglioma in walleye, cyanocobalamin B12 metabolism in rainbow trout, and encephalocoele lesions in brown trout).
- * Served as liaison for DNR with the state Health Department, Veterinary Diagnostic Laboratories, and Livestock Sanitary Board -- to coordinate efforts in preventing the transmission of diseases in animal populations.
- * Co-authored reports: "Parasites and Selected Anomalies of Some Fishes of the North Central States and Canada"; "Vitamin B12 Absorption from Fish"; and "Selection of Water Supplies", a chapter for the Great Lakes Fish Disease Control Committee's manual: "A Guide to Integrated Fish Health Management".

Chemistry Laboratory:

A total of 3,200 samples and/or specimens were received by the laboratory during the Biennium, and some 8,360 tests performed. Examples of work performed include the following:

- * Analysis of water samples collected during lake and stream surveys, pollutional spill 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 Wildlife Section and the 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 Department's Non-Game 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.
- * Analysis of game farm food (used in pheasant rearing) for trace metals.
- * Light hydrocarbon analysis of well water samples collected from the underground natural gas storage area in southern Minnesota.
- * Rotenone content of fish toxicant formulations used by the Section of Fisheries to reclaim lakes.
- * Mercury content of fish flesh to determine potential effect on fish health and fish edibility (in cooperation with the State Health Department and the Pollution Control Agency).
- * PCB's and other chlorocarbon residues in fish flesh to determine potential effect on fish health and fish edibility (in cooperation with the State Health Department and 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 to Division of Fish and Wildlife and Department personnel on numerous questions and issues related to chemistry, limnology, animal nutrition, environmental contamination, and pesticides.

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FOREST RESOURCE MANAGEMENT

The Division of Forestry's goal is to manage and protect Minnesota's forest resources. This provides improved wildlife habitat, quality forest recreation opportunities, increased yields of wood, and conservation of land and water resources.

Major functions of the Forest Management Program include forest fire protection on 22.8 million acres; insect and disease protection on 16 million acres of forest land; management of 4.6 million acres of state administered forest land; forest and shade tree management assistance to small private land-owners, counties, schools and municipalities; and assistance to wood users to improve utilization and marketing of the timber resource. The overall purpose is to maintain the social and economic benefits of forest resources, for present and future generations.

The Legislature recognized the importance of Minnesota's forest resources by passing the Forest Resource Management Act of 1982. This Act, along with the continuing forest management intensification effort and the recent expansion of the waferboard and paper industries, illustrate the importance of forest resources in future development of the state's economy.

Summaries of specific accomplishments, during the Biennium, by Division of Forestry programs, follow.

Wildfire Protection

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

Prevention is informing the public of the dangers and losses caused by uncontrolled fires, improper machine use, incendiarism, and carelessness. This is accomplished through public education, burning permit regulations, and law enforcement.

Pre-suppression, basically, is preparing suppression forces for the eventuality of a fire and the necessary detection to locate fires. Training is conducted and inter- and intra-state agreements maintained for crews and equipment. Regional and statewide plans are developed. Organization structures to cope with large fires are delineated. Dispatching plans are prepared and maintained. Weather and associated fire danger is monitored. Equipment is maintained at a state of readiness, or contracted for on a standby basis. Detection is accomplished through a network of lookout towers, aerial detection flights, and public cooperator reports.

Suppression is the control and extinguishment of forest and grass fires at the minimum possible size, in the shortest time possible, considering values at risk. This is accomplished by a balanced application of suppression forces including: training crews, tractor and plow units, dozers, fire trucks, pumps, hand tools, airtankers, retardants, and helicopters equipped with water-dropping capabilities.

In FY 81, a total of 1,590 fires burned some 65,000 acres. In FY 82, some 980 fires burned approximately 26,000 acres. This compares with a 20-year average of 1,317 fires, and 58,278 acres burned.

Peak periods of fire danger during the two fiscal years were relatively normal, with brief periods of higher than normal danger. Suppression was without notable incident. Fires were controlled, using normal suppression forces.

Construction on the Hibbing airtanker base was completed to the extent that funds would allow. This included an access road with security gate, the aircraft ramp, and three complete wells.

The LCMR Fire Management Analysis Project continued in 1981, with the project meeting its projected accomplishment of completed data collection for Regions I and II. Data analysis and plan preparation continued. Additional funds to complete the balance of the state was granted by the LCMR. Data collection is being accomplished in Regions III, IV, V, and VI.

During the winter of 1981-82 a project was started to develop a ground system of foam application. This had proved successful in several other states. Two individuals were sent to Texas, where the unit was developed, to obtain equipment details and suppression information. Subsequently, two units were purchased and assembled in the Central Region. It is anticipated that use of such units will grow in the Division's suppression activities, as well as with rural fire departments. The system will expand abilities to protect buildings and construct fire breaks in difficult situations.

Fire cost collection and law enforcement were greatly strengthened by conducting two law enforcement training sessions. The results will add to the fire prevention program. A notable increase in fire cost collection and criminal law enforcement is already evident.

Rural Community Fire Protection Program

This program is designed to assist rural communities in fire protection, and to aid their respective fire departments in developing and improving their wildland and structural fire suppression capabilities. A federal matching fund is utilized through the state organization, with the fire department providing 50 per cent of the project cost.

During the Biennium, more than 350 applications each year were screened for funding. A total of \$133,000 (FY 81) and \$119,400 (FY 82) for purchase of equipment and training was assigned to 156 and 134 fire departments, respectively.

It is anticipated that for FY 83, the funding will be restored to the original level of \$133,000 and will be allocated as in the past. More than 350 applications for over \$1.75 million are expected during FY 83.

One of the requirements of the program is that of retaining an inventory of those items purchased with matching funds that are individually valued at \$300 or more. This year a complete "hands-on" inventory check was made on a statewide basis. Presently, this inventory covers over 1,100 items with more than 390 different fire departments.

Federal Excess Property

Another phase of the Rural Community Fire Protection Program involves assigning federal excess property to fire departments throughout the state. This equipment is assigned under specific individual fire department agreements, and is available to aid in suppression of wildfires.

The assignment of 17 vehicles to fire departments during FY 81 and FY 82 has increased slightly over the previous Biennium, but continues below the 20 to 25 vehicles per year average. This is partially due to a decrease in availability and largely due to the high cost of transportation to secure these units in Minnesota. There are presently 117 requests for these units and associated pumps, tanks, and communications equipment.

The availability of this type of equipment is improving slowly. With the possibility of securing adequate transportation funds, it is anticipated that another 15 to 20 vehicles can be assigned this coming year.

Currently there are 115 vehicles, 68 mobile radios, and 18 pumps and/or tanks assigned to fire departments around the state. Four vehicles, 19 base radio stations, 12 mobile radios, and 7 pumps are currently being prepared for assignment in the near future. This will bring a total of 243 pieces of equipment on inventory with fire departments in Minnesota.

Forest Roads

The Department of Natural Resources has a system of 1,798 miles of forest roads, as determined by the newly compiled state forest road inventory. The roads are, for the most part, within the boundaries of the 55 designated state forests.

The new road inventory is a part of the State Forest Road Plan completed in June 1982, as part of the Minnesota Forest Resources Planning effort.

During FY 82, reconstruction was carried out on 49.3 miles of existing forest roads and maintenance work was performed on 1,283 miles. Eight bridge repair or replacement projects were completed.

For FY 83, the anticipated BWCA funds will be utilized for a continued maintenance and reconstruction program. Forest road and bridge bonding funds will be utilized for bridge replacements and major reconstruction projects.

The Department is requesting funds through the legislative process for additional road maintenance and repair. Any such funding obtained will greatly strengthen the road system; which is a major factor in supplying timber, providing fire access, conducting forest development activities, and providing public recreational opportunities.

Forest Development of State Lands

During FY 82, the DNR reforested 13,750 acres of state owned land. Of that total, about 3,500 acres were aerial seeded by helicopter in order to restock areas too difficult to plant. The remaining 10,250 acres were planted with 7,264,000 seedlings, or seeded by snowmobile and by hand.

In order to protect established conifer plantations from competing vegetation, the Department applied herbicide to about 4,800 acres of state owned land. Another 700 acres of plantations or natural stands were released by hand labor, or were improved by thinning.

During FY 83, the DNR expects to reforest 14,760 acres with 9 million seedlings and 500 pounds of tree seed. Depending on the need for protecting individual plantations or natural stands from undesirable vegetation, the Department may find it necessary to apply herbicide to anywhere from 5,000 to 7,500 acres.

During FY 82, more than 22,500 acres of state land administered by the DNR was harvested for timber products. As forest industries expand to utilize the annual recommended harvest of 46,000 acres from state lands, the DNR will be increasing its reforestation efforts, accordingly.

Timber Sales

The past two years brought significant changes in the timber sales program. Demand for timber dropped drastically after increasing for a number of years. The 1981 Legislature made major changes in the timber sale laws.

The drastic slump in the housing industry had a major effect on the timber industry. The volume of timber sold from state lands dropped from more than 500,000 cords in FY 80, to 422,000 cords in FY 81. In FY 82, the volume sold increased somewhat, to 435,000 cords. Less than 50 per cent of the volume offered at auction sales was purchased. This is considerably less than the 70 to 80 per cent that normally sells by auction.

Revenue from the sale of state timber remained about the same, even though the volume decreased. This was due mainly to the increased stumpage value. Receipts for each of the fiscal years were approximately \$3.3 million.

Changes made in the timber sale laws were designed to improve the processing of the permits, and to make auction timber more available to the small independent logger. The maximum value of the informal permit was increased to \$3,000 and the regular auction to \$20,000. A new intermediate type auction permit with a maximum appraisal value of \$7,000 was authorized by law. Restrictions on the sale of the intermediate auction limit its purchase to the small independent operator; and assure that more bidders have an opportunity to purchase permits, by limiting the number each may acquire. The efficiency of timber sale preparation and supervision is related to the size of the sale. The law change had a big effect on the permit size; with the average permit in 1982 almost 40 per cent greater in volume than 1981. This trend should continue in the future, with an increase in efficiency, not only for the Department in selling the timber, but also for the logger in harvesting the timber.

The timber demand probably will not improve much until FY 84. If the economy improves and housing starts increase, FY 84 could be very good. The new plant capacity of Minnesota forest industries will enable most of the allowable cut to be used.

State Forest Acquisition Program

All acquisition this Biennium was concentrated in the Richard J. Dorer Memorial Hardwood State Forest. Tracts acquired were identified in the ten year plan for acquisition, and represent transactions with willing sellers.

The 1982-83 Biennial appropriation for state forest land acquisition was \$200,000 -- a greatly reduced level from past years. Field personnel have identified 125 individual landowners who are willing to sell land to the state, within the compartments identified in the acquisition plan. This represents approximately 11,000 acres available to DNR. The 1982-83 appropriation will be expended before the end of the Biennium. Options have been taken on three tracts, and a fourth parcel is in the appraisal-negotiation stage; which will add 300 acres to the Memorial Hardwood Forest.

Nursery Operations

The DNR tree nurseries shipped 21.45 million tree seedlings for planting in the spring of 1982, and processed more than 4,800 individual tree orders. About 50 per cent of the seedlings were planted on public lands. Private landowners purchased the remainder of the seedlings for planting on their lands, including a small amount purchased by the forest industries. These seedlings reforested about 27,000 acres of land. In FY 83, the nurseries expect to ship 28 million seedlings that will reforest 35,000 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.

Some of the tree improvement activities included the grafting of White Spruce and White Pine (blister rust resistant) in FY 82; the establishment of five seed production areas (six acres each) for Norway Pine seed; and 11 acres prepared for planting grafted or improved stock. So far, 16 acres of White Spruce grafted stock and 5 acres of a Black Spruce seed orchard are being maintained annually.

Insects and Disease

Fiscal years 1981 and 1982 brought both strong advances and major changes in the Insect and Disease program. Emphasizing the concept of integrated pest management, the unit prepared guidelines for pest management of the major forest cover types in Minnesota. In addition, changes in the harvesting guidelines for pine stands, to address bark beetle and shoot blight problems, were accomplished. The development of these guidelines was supplemented by active participation in training sessions and meetings to present these new techniques to field foresters.

The transfer of responsibility for the Division's herbicide program to the Insect and Disease unit was the major change in operation during 1981-82. This additional responsibility carried a significant workload demand. The transfer was designed to center responsibility for all pesticide programs within the unit with the most training and expertise in pesticide management.

Insect activity within the state was reduced over the previous Biennium. Control programs for the pine tussock moth outbreak near Willow River, coupled with favorable environmental conditions, reduced this population to an acceptable level. The jack pine budworm outbreak in northwest and north central Minnesota collapsed as a result of natural causes, but a new outbreak (2,000 acres) was discovered in 1982 in northeast Minnesota. The forest tent caterpillar infestation in northeast Minnesota declined from 4.4 million acres in 1979, to approximately 600,000 acres in 1982.

However, the gypsy moth, a serious defoliator of hardwoods in the northeastern United States, was introduced into the St. Paul/Minneapolis area in 1981. From all present indications, this insect will become established. Other serious insect problems encountered during 1981-82 included the pine bark beetle, saratoga spittle bug, and the bronze birch borer.

Dutch elm disease and oak wilt continued to take their tolls on the hardwood and urban forests. The insidious losses due to forest disease organisms such as shoot blights, cankers, and wood rot were also common. A study to evaluate microclimatic conditions and their relationship to white pine blister rust was conducted, to assess strategies for regenerating white pine in Minnesota.

The Unit maintained its responsibilities for pest survey and detection by surveying more than 16 million acres per year. Direct control of forest pests was accomplished on approximately 8,000 acres during the Biennium.

The Unit will continue to direct its programs toward the management of forest pests. Expansion into nursery, Christmas tree, and urban pest problems will be continued in the 1982-1984 Biennium.

Dutch Elm Disease

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 communities, municipal governments, landowners, 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.

Minnesota proposed to demonstrate the effectiveness of known Dutch elm disease management practices in the cities of Fergus Falls, Granite Falls, Hutchinson, Litchfield, Little Falls, and Wadena. It was hoped that this federally-sponsored technical assistance and education program, together with active state and municipal cooperation, would encourage the communities to develop effective disease management programs of their own. It was thought that this demonstration project would serve as a predictor of the costs of future municipal disease management programs, and of the aesthetic considerations that become necessary when much of the tree population is removed and eventually replaced.

The goal of the program was to reduce losses within the economic and political limits of the small city. The following management practices, recommended by project personnel and listed according to priority, formed the basis of Minnesota's demonstration program:

1. Diseased tree and woodpile inspection
2. Diseased tree removal
3. Root graft barrier placement
4. Program ordinances
5. Redefining ordinances
6. Trimming/removal of weakened or dead elms
7. Application of Dursban
8. Therapeutic pruning
9. Systemic fungicide injection
10. Elimination of wild elms
11. Utilization

This federal demonstration program was terminated at the end of 1981; but Dutch elm disease continues to be a problem. Millions of trees used for shade, windbreaks, and wood products are being lost, and municipalities are still confronted with the financial burden of removing large numbers of trees. The program was instituted to unify the individual attempts, by communities across the country, to deal with this disease. These individual programs often duplicated what had been done before, and were found to be costly and ineffective. Through the federal demonstration program, a workable and cost-effective formula for Dutch elm disease management was developed. The six Minnesota communities were given the necessary knowledge to keep their urban forestry programs going without assistance, through the completion of the following objectives.

- * Basic tree removal programs were elevated to high level sanitation programs by using known disease management practices: inspection, tree removal, root graft barrier placement, systemic fungicide injection, therapeutic pruning, etc.
- * Losses due to Dutch elm disease were reduced and spread out through the years of the program, thus enabling each city to develop a workable plan on how to absorb the financial burden of removing all diseased trees and establishing a new urban forest.
- * The value of each municipal disease management program was examined in terms of the expenses incurred when carrying out that program as well as in the terms of the aesthetic considerations that became necessary when having to remove and eventually replace a large portion of the tree population.
- * People were educated through public information and outreach programs on the how's and why's of Dutch elm disease so that when financial and technical help would no longer be available through state and federal programs, each municipality could continue the disease management program on its own.

Although the DNR had the position of "leader" in this demonstration project, it worked cooperatively with the United States Forest Service, the Minnesota Department of Agriculture, the Extension Service of the University of Minnesota, and the six participating cities. The DNR was responsible for distributing the money to all program participants except the Extension Service, which was funded separately. The 1978 through 1981 appropriations for the establishment of these high performance disease management programs totaled \$1,614,657. In 1982, the DNR was given an additional grant of \$47,100 to write the final summary reports of the demonstration program, for all five participating states.

Private Forest Management Assistance

Non-industrial private forest lands in Minnesota comprise about 5.6 million acres. These land holdings are owned by 120,000 individual landowners.

Many private forest tracts are in need of reforestation, and improvement of the existing stands of trees. The Division of Forestry is concerned with the condition of these small forested properties, and is assisting private landowners to better manage their forests for multiple-use benefits.

DNR foresters provide professional forestry technical guidance to private landowners in the management of their forest resource. Services provided include advice on tree planting, timber stand improvement, harvesting, marketing assistance, and preparation of management plans.

During the Biennium, DNR foresters helped more than 7,000 landowners develop their forest properties. More than 100,000 acres of private forest land was improved.

Fifteen full-time forestry positions were added to complement the existing effort in private forestry. These positions provide a major thrust in addressing private forest land management issues. In addition, a cooperative effort was established between the Division of Forestry and the State Soil and Water Conservation Districts to provide state cost-sharing funds for private forest land improvement practices, such as road construction and fencing, in seven southeastern Minnesota counties. The program has been funded minimally this past Biennium because of the current fiscal problems existing in the state.

County Assistance Program

This cooperative program provides DNR foresters in counties with large acreages of tax-forfeited lands to manage. Half of the program funding is provided by the eight participating counties, and the other half is from general fund monies and Iron Range Resources and Rehabilitation Board grants. The primary function of the nine foresters is to aid the county land departments in the administration of forest management operations on tax-forfeited lands.

The counties of Lake, St. Louis, Itasca, Aitkin, Crow Wing, Beltrami, Becker, and Clearwater currently participate. Requests by other counties for C.A.P. assistance may include timber or land appraisal for land exchanges, land sale, timber sales, easements or leases; or special uses and purposes such as management or administrative planning for projects.

The impact of the C.A.P. program has been the direct involvement with county land departments, whose revenues have increased to \$3.5 million annually, 40 per cent of which is used for expenses, 40 per cent apportioned to other taxing districts, and 20 per cent earmarked for development. Since 1980, the state legislature has also provided the counties with in-lieu-of tax payments and BWCA forest intensification funding.

The \$2.5 million spent by the counties provides for the intensification and improvement of management of the lands, forests, woods roads, public land recreation and water resources. Staff additions within the counties; along with the other DNR cooperative projects such as forest inventory, wildlife improvements, peat, water, shoreline and ownership inventories; have

provided the data for improved management for the resources base demands. The DNR C.A.P. foresters provide guidance and aid for this management and administrative responsibility on these tax-forfeited public lands of the state.

Urban and Community Forestry

Providing Minnesota communities with technical assistance in urban forest management is one of the goals undertaken by the Division of Forestry. Toward this end, the Division has used U.S. Forest Service matching funds to maintain an urban forest specialist on its field staff. In addition to working directly with communities requesting assistance, an important function of this program has been to upgrade the ability of the Division's field foresters to provide technical assistance in urban forest management and planning. The effect has been to amplify the positive effects of one small program throughout the entire state.

Annually, the Division works with more than 100 communities and thousands of urban and suburban landowners. Assistance with tree planting, care and maintenance, management planning, urban wood utilization, urban development and multiple-use management has helped municipalities wisely use their urban forest resources; as well as efficiently utilize their forestry budgets.

With the advent of catastrophic shade tree diseases, management plans have proven invaluable tools for providing for the orderly transition of the urban forest. Several matching grants to cities have been provided by the program, for the development of comprehensive urban forest management plans. These plans serve both to aid the individual cities as well as demonstrate their effectiveness to other communities.

Support and promotion of the Tree City U.S.A. award program has more than doubled the number of recipient cities in Minnesota. This award gives national recognition to cities with superior tree management programs. The program serves as an indication of the interest Minnesotans have in their city trees, and the success the Division has had in promoting and providing assistance in urban forestry.

Forest Products Utilization and Marketing (FPU)

The FPU program provides technical assistance and services designed to improve the utilization and marketing of Minnesota's forest resources. Improved utilization can take place when the trees are harvested and cut to length for logs or pulp; or when the wood is processed by primary or secondary manufacture. Improved markets provide economic incentives to landowners, loggers, and wood processors to improve forest management and wood utilization practices.

A major emphasis of the FPU staff was directed towards assisting industries that plan to utilize wood residues for energy. The wood pellet industry development, and the increasing use of green chips for fuel, are examples of this.

DNR Forestry also completed a residential firewood-use survey that determined the amount and number of households that burned wood for heat during the winter of 1979-80. This information resulted in development of a 20-year projection of fuelwood use and source identification for fuelwood.

A demand and supply assessment of Minnesota resources was also developed. This analysis provides information for planning, management, and utilization efforts for the next 20 years. Aspen demand by the paper and waferboard industry will increase nearly 2½ times in the next 20 years.

One major project, conducted in conjunction with the University of Minnesota College of Forestry and the U.S. Forest Service, was an analysis of the market potential and product acceptability of white birch. The white birch resource remains in surplus supply in Minnesota. This project identified potential product uses, especially for furniture parts, of Minnesota white birch.

The recession of 1981-82 has caused severe hardship for the sawmill industry in Minnesota. Production of sawtimber decreased significantly; up to 30 per cent in some cases. The industries utilizing pulpwood roundwood held fairly stable, although the newly developed waferboard industry was operating at 60 to 75 per cent of capacity. The utilization and marketing effort was directed at assisting companies, as well as loggers, with market development for their products.

Another major responsibility of the FPU staff is to provide forest resource data to developing or expanding forest industries. Major contributions were made to Blandin Paper Company, Boise Cascade Corporation, Red Lake Indian Mills, and Nett Lake Sawmill, in providing the resource data needed for their development and expansion.

The FPU staff also assisted loggers, sawmill operators, dry kiln operators, and wood consumers and answered general inquiries from the public. A main objective of the program is to cooperate with other Minnesota agencies that work with wood products. These included the University of Minnesota Extension Service, and College of Forestry; U.S. Forest Service State and Private Forestry; the Minnesota Department of Energy, Planning and Development; the Governor's Council on Rural Development; and a number of other economic development organizations, as well as local and county governments.

Forest Inventory

Accurate forest resource information is essential for effective management and proper utilization of the forest resource. The data must be up to date and reliable.

The DNR is involved with two forest inventory systems. One system, called Phase One, is a cooperative effort with the U.S. Forest Service and involves forest resource data from more than 10,000 permanent plots. This survey, which provides information on the total forest resource on all land in Minnesota, is essential for overall resource management and multiple use planning.

Field work for the survey was completed in 1977 by the U.S. Forest Service and the DNR. Two state reports and four survey unit reports were published by the U.S. Forest Service in 1981 and are now available. The DNR prepared reports on the forest resources of 23 northern counties. These reports were published in 1981 and are available from DNR Central Office, St. Paul.

The second inventory system, called Phase Two, is an on-the-ground examination of all forest types on state and county lands. This inventory provides the information needed by the forest manager to intensify management of the forest resource. The forest inventory of seven million acres of state and county land is scheduled for completion in 1985. Inventory has been completed on a total of 4,677,000 acres.

During the Biennium, inventory projects were in progress in Becker, Aitkin, Pine, Crow Wing, Cass, Beltrami and Lake counties; and in a number of state forests. This exceeded the goal for the period. Inventory has been completed on all state and county lands in Hubbard, Pine, Clearwater, and Carlton counties. Inventory on both state and county lands is now complete in 26 of the 55 state forests.

Forest Resources Planning

The Forest Resources Planning Program began in July 1981 when the Legislative Commission on Minnesota Resources (LCMR) approved and funded the program. The Biennial objective was to develop a statewide plan to address all forest resources and forestland ownerships, through an interdisciplinary DNR effort. The project also involved other public resource management agencies, forest industries, the University of Minnesota, conservation organizations and the general public.

The statewide plan, known as the Minnesota Forest Resources Plan (MFRP), consists of seven documents. These are: 1. Concept; 2. Issues; 3. Assessment; 4. Goals and Strategies; 5. Allocation of Targets; 6. Division of Forestry Program; and 7. Action Plan.

These documents are being used to develop forest resource program budgets, and to guide forest resource management programs. The plan takes into account timber, wildlife, recreation, soils, water, and environmental protection.

In 1982, the Forest Resources Management Act was passed. This Act formally requires that the MFRP be completed, and continuously updated. It also requires that forest unit plans be completed. During the 1982-84 Biennium, forest resource plans will be completed for forest administrative units in Minnesota. An interdisciplinary approach will also be used in this effort.

In addition to the MFRP, the Division of Forestry completed a State Forest Road Plan during FY 82.

Planning Review and Environmental Studies

This activity is associated with the Department of Natural Resources Planning and Environmental Review Team (PERT). The chief responsibility is to represent the Division of Forestry in reaching Departmental position/policy consensus on environmental review matters; long-range comprehensive natural resource plans; management plans for trails, rivers, parks, forests, and wildlife management areas; proposed environmental legislation and rules; and all formal Departmental policy statements.

In addition to seeking resolution of conflicting internal viewpoints on planning and environmental review matters; detailed analyses are made of draft Division of Forestry position/policy statements, and on external documents such as draft plans, project proposals, study reports, environmental assessments, and others.

A report was prepared on: "Incorporation of the Silviculture Portion of the Minnesota Water Quality Plan into the Minnesota Forest Resources Plan". This report shows the development of the Water Quality components of the Minnesota Forest Resources Plan; the effectiveness of using forestry cost-share programs in stimulating private landowners to implement water quality related conservation practices; and details an examination of regulation and water quality management implementation.

A new forest soils program was developed that provides site specific forest soil interpretations to forest managers, which will enable the Division of Forestry to concentrate intensive timber management on the most productive forestland. Three new Regional forest soil specialists now provide technical assistance for forest management.

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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.

Management activities include mineral and peat leasing; evaluation of mineral potential; inventory of peat resources; data input in land-use decisions; environmental review of mining projects; and the regulation of the effects of mining, through development and implementation of mineland reclamation rules and peatland reclamation.

Division of Minerals' goals are to provide equitable rental and royalty income from the exploration and development of these 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. 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 per cent 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 may be 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.

The Division provides for the exploration and leasing of these mineral lands, economic and environmental review, royalty accounting, engineering and inspection support to insure permit and lease compliance, evaluation of mineral potential, metallurgical research and testing, and cartographic and chemical laboratory support.

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 peat lands; the changing economics of the various mineral industries; and the development of new technology for reclamation, environmental protection, and evaluation of environmental and socioeconomic impacts all combine to make the Minerals Program a diversified and innovative activity.

Iron Ore and Taconite

Iron ore and taconite from the Mesabi Range continued to dominate the mining scene in Minnesota during the Biennium, although production continued to decline from the peak taconite pellet production year of 1979. The state, through its trust fund and tax-forfeited mineral ownership, owns approximately 19,600 acres on the Mesabi Iron Formation, or about 18.5 per cent of the area.

During the Biennium, the Division completed negotiations for and issued one new taconite lease. Seven leases were terminated, leaving a total of 149 iron ore and taconite leases in St. Louis and Itasca counties administered by the Division.

Of the United States' installed operating and potential standby 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. However, the maximum production to date occurred in 1979, when 56.2 million tons of pellets were shipped from Minnesota. State-owned taconite represents a substantial portion of the reserves of all eight operations. Due to a surplus of pellets and the state of the economy, a significant downturn, resulting in plant shutdowns, began in FY 82.

During the Biennium, a total of 63.8 million tons of state-owned natural iron ore and taconite was mined to produce taconite pellets and iron ore concentrates. The state's rental and royalty income received during this period was as follows:

Trust Funds	\$4,488,862
Acquired State Forest	4,332
General Revenue	282,623
Taxing Districts	1,230,492
Special Advance Royalty	725,153
Total	\$6,631,462

Of this total, \$197,809 was received as rental from state copper-nickel leases. The latter are discussed in the following section on "Nonferrous Minerals".

Nonferrous Minerals

In addition to its iron ranges, Minnesota has other rock formations which are currently receiving considerable attention for their mineral potential. Minnesota has a variety of geologic environments that are favorable for the occurrence of nonferrous minerals. The Division had an active nonferrous mineral leasing program between 1966 and 1973. During this period the state held six nonferrous lease sales. A total of 2,143,923 acres of state-owned mineral rights were offered for leasing. This 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. Since that time, two negotiated leases have been awarded in Beltrami County. As of July 1, 1982 a total of 15 issued at the previous sales remained in effect. These covered 4,449 acres in St. Louis County; for a total of 17 leases involving 4,769 acres.

During the Biennium the Division, at the request of the State Executive Council, amended the state copper-nickel rules. The amendment adds a special royalty clause to the state copper-nickel lease, to address the possibility of an unusually rich ore discovery. In November, 1982 the Division plans to hold its first nonferrous mineral lease sale since 1973. This lease sale is anticipated to cover approximately 1.5 million acres of mineral land in St. Louis, Itasca, Koochiching, Beltrami, Lake of the Woods, Roseau, and Marshall counties. A lease sale of this type is expected to generate approximately \$10 million worth of exploration in northern Minnesota.

These lands overlie Minnesota's greenstone formations, which occur widely throughout the northern half of the state, and which are the host rock of much of the mineral wealth of the adjoining Canadian provinces. The greenstone formations have potential for base and precious minerals such as zinc, lead, copper, gold, and silver. In Canada these formations are typified by high-grade, relatively small mineral deposits. Some of the land being considered has been offered in previous lease sales, but in light of interest shown by

exploration companies, new geologic data, and exploration techniques developed during the past few years, it is felt that within these lands there is significant potential for the discovery of mineral resources. Certain new lands of interest are also included in the lease sale.

The leasing of state minerals in the past has resulted in the discovery of several potential ore bodies, but, to date, none of these have been developed into mines. The majority of the favorable results have been obtained from exploration in the Duluth Gabbro Complex in northeastern Minnesota.

The significance of these copper-nickel deposits in the gabbro is of major importance to the state. A recent estimate by the Division indicates that about 4.4 billion tons of mineralized material, with an average grade of 0.66 per cent copper and 0.2 per cent nickel, exist in the northwestern part of the gabbro in Lake and St. Louis counties. This represents the largest known source of nickel in the United States, with a combined gross copper-nickel value of more than \$80 billion. Some of these copper-nickel ores are held by exploration companies, under state leases.

The legislature in 1980 enacted an exploration bill that requires explorers to be registered by the Division of Minerals as of May 1, 1980 and licensed by the Health Department as of January 1, 1981 before conducting exploratory borings. The bill further permits access to drill sites before, during, and after drilling to various governmental agencies. Exploration activities have been closely monitored, and at least a quarter portion of all drill core is obtained by the Division and placed on file.

During the Biennium there were 21 registered drillers in the state. Of this number, 12 companies drilled a total of 75 holes on lands in 22 counties. A total of 54,000 feet of drill core from previously drilled state leases and drill core turned in under the Exploration Bill was received and classified. Of this total, 10,000 feet was from ferrous drilling and 44,000 feet was from nonferrous drilling.

Several geological formations in Minnesota have been of considerable interest to explorers searching for uranium. Most of this activity has been concentrated in Carlton and Pine counties. Although private mineral leases for uranium remain in effect, the recent decline in the demand for uranium has caused a stoppage in active uranium exploration in Minnesota. No announcement of discovery of mineable concentrations of uranium has been made by the uranium exploration companies in 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 per cent 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.

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. Fifty-six line miles of geophysical surveys were conducted, and 1,787 mineral samples were collected and evaluated. The chemistry laboratory in Hibbing made 42,737 chemical determinations during this Biennium.

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 hole in particular produced significant results. This hole 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.

The knowledge of the mineral potential of Minnesota also helped in recent litigation on severed mineral taxation. The Department received a favorable ruling from the Minnesota Tax Court in this matter.

Mineland Reclamation

The Division is charged with the development and administration of the state's Mineland Reclamation program. The Mineland Reclamation Act requires the reclamation of all active and any future metallic mining operations in the state. Promulgation of reclamation rules for iron ore and taconite occurred in August 1980.

The state's 12 active mining companies have submitted 22 permit applications. Each contains a mineland reclamation plan for the life of the mining operation. Eleven permits have been granted, with the remainder in various stages of the permit review process.

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

- * Revegetation Research-Work is being done to monitor and evaluate past revegetation programs, 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 Reclamation Act covers all metallic minerals). - 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, 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 removing 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.

An important aspect of mineland reclamation is the identification and use of mine facility sites that will minimize environmental and land-use impacts and mining and reclamation costs. The Division of Minerals has developed two land information systems. MINESITE, a system developed for the copper-nickel resources of northeastern Minnesota, was completed during the previous Biennium (July 1, 1978-June 30, 1980). The Iron Range Information System (IRIS), developed for the Mesabi Iron Range, is being completed during this Biennium. IRIS is discussed in more detail below. The two data systems (MINESITE and IRIS) are being used to assist the East Range Land-Use Committee in identifying mining and other land-use conflicts in an area along the eastern end of the Mesabi Iron Range. This project is also described in more detail below.

Iron Range Information System

The Iron Range Information System (IRIS) is a computerized data base study for the Mesabi Iron Range that will provide information for future land-use planning, mineland reclamation permit coordination, permit evaluation, and the evaluation of policy alternatives for comprehensive resource management. During FY 77, a work-plan was developed, and funding

was received for FY 78 and FY 79. Initial work on compiling resource data was begun in FY 78. It is expected that the data base will be essentially completed by June 30, 1983.

The system has already proven useful to several projects within and outside the Department. For example: data from IRIS was used in evaluating stockpile sites for a proposed expansion of Oglebay Norton Mining Company's operations, southwest of Eveleth. Since this site was within the pilot study area, data coverage was quite complete. Maps of 24 variables were produced at 7½-minute quadrangle scale with outlines of the proposed stockpiles. These maps allowed visual analysis of the stockpile sites in relation to the natural resources and land uses of the area. Tables comparing each of the stockpile sites with each of the variables produced a numerical description of the number of acres of land, the natural resources, and the current land uses that would be disturbed by developing the stockpiles. Since a land exchange is required for the project, tables were also developed for the state lands requested by the company. The maps and tables are contained in: "Draft Supplemental Environmental Impact Statement for the Oglebay Norton Expansion Project." IRIS was also used in compiling data for an Environmental Assessment Worksheet, prepared for U.S. Steel's proposed Sherman Taconite Operation.

East Range Land-Use Committee

IRIS and MINESITE were used together to identify land-use conflicts in the East Range Area. At the eastern end of the Mesabi Iron Range, copper-nickel resources abut and overlap taconite reserves. The East Range Area also contains significant timber, recreational, wildlife, water, and scenic resources. Representatives of the mining companies, cities, counties, and state and federal regulatory agencies established the East Range Land-Use Committee to identify potential conflicts.

Each Committee member identified his organization's land needs for the next 50 years. Land needs were mapped and conflicts identified by using IRIS and MINESITE. A draft report has been completed and a final report will soon be completed. The work completed by the Committee represents the first step in a long-term planning process, and provides information that can be used to assist all parties in the East Range Area to minimize and resolve these conflicts.

Mining of Aggregated and Other Industrial Minerals

The mining of aggregates is an essential and important segment of the Minnesota economy. It is surpassed in dollar value only by iron mining. In past years Minnesota has had an adequate supply of aggregates for road and construction purposes. However, the availability of sand and gravel and other industrial minerals is becoming a critical problem in certain out-state areas, and in the metropolitan regions.

Urban development continues to encroach on valuable sand and gravel deposits without regard to the impacts on economic development; especially in the metropolitan areas. Zoning by local government is gradually eliminating historic commercial gravel operations and precluding the future mining of essential gravel resources needed in the construction industry.

The Legislature has reacted to this concern by requesting information from the DNR about the aggregate industry. In response to this request, the Division of Minerals published "Industrial Minerals in Minnesota: A Status Report on Sand, Gravel, and Crushed Rock". This report gives a general overview of the availability and quantity of aggregates, the aggregate industry, and local zoning regulations. This report was widely distributed to local government and private industry and has received much favorable comment. Although sand and gravel are not classified as minerals, the Division evaluates and manages sand and gravel resources and other industrial minerals located on state and county-owned lands.

In recent years, a new specialized type of aggregate demand has developed; related to the increase in oil exploration. Minnesota's Jordan Sandstone rock formation has the potential of becoming a major world source for coarse grained silica sand, used in a new process for developing oil wells, called "hydrofracturing". Hydrofracturing sand requires a high percentage of number 40 size granules of silica sand, such as those found in the upper part of the Jordan Sandstone. A substantial increase in silica sand mining is expected. Several new mines are located along the Minnesota River valley, where the Jordan Sandstone is located close to the surface.

Other industrial minerals may also be of interest. For example: the paper industry has recently become interested in mining the kaolin clay deposits in the Redwood Falls area for use as a filler in making paper.

Reserve Mining Company

Reserve Mining Company's Mile Post 7 tailings basin has operated successfully for almost three years. The Division is continuing its inspection and permit activities to insure that all aspects of the Mile Post 7 project continue in compliance with the permit and court orders. The Division is also coordinating its activities with other state and federal agencies.

Severed Mineral Interests

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 per cent of the tax collected goes to the local taxing districts. The remainder is apportioned to an Indian Development 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. Some 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.

During FY 82, the Division of Minerals assisted the Attorney General's office in the litigation of a case in the Minnesota Tax Court, involving the Severed Mineral Interests Law. The Tax Court found that all mineral rights have some value; so that the Severed Mineral Interests Tax is constitutional. This case is currently on appeal to the Minnesota Supreme Court.

Peat Program

This Biennium, the Peat Program has fully assumed the management priorities outlined in 1981 at the end of five years of peatland research. Although continued study of peatland development options and impacts remains a concern, development planning and site selection have become the program's chief priorities.

Development planning activities include the identification of reclamation methods and regulations; the encouragement of small-scale energy and horticultural industries; and the environmental screening of development proposals, with the intent of mitigating adverse impacts.

In the interest of pursuing sound reclamation measures for all of the state's potential peat mining areas, the program has drafted a bill as a model for possible legislative changes. In addition, the program has collected information on reclamation methods of various types, to help guide the selection of reclamation procedures for specific sites.

Small-scale energy and horticultural development is being encouraged, through the regular offering of leases in areas of interest, and through the collection of information concerning marketing and transportation factors that affect these industries. A 620-acre peatland in St. Louis County was leased in December 1981. A second area will be offered for lease in November 1982.

Proposals submitted by developers are screened to identify potential adverse impacts. Many of these impacts can be successfully mitigated by working with the proposer on the siting and preliminary planning of the development.

Site-selection work, the identification of peatland areas and sites suitable for development, has progressed measurably. In the past year, preliminary computer maps were produced that show the peat areas of greatest development potential in an eight-county region. Also identified are areas with highest suitability for protection and preservation for future use. The results of this preliminary work revealed almost

one million acres of peatland with development potential and a peatland reserve of more than 2.5 million acres, of which about 300 thousand acres are protection candidate areas. Areas with highest development potential had to satisfy criteria of accessibility, size, and environmental suitability.

Further work in site selection continues, with the objective of refining mapping techniques to identify specific sites. A pilot study area, southwest St. Louis County, is currently being mapped for this purpose.

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PARKS AND RECREATION MANAGEMENT

Park Development

The 1981 Legislature appropriated \$7,042,800 for state park development and rehabilitation, of which \$4,608,000 was from LCMR and \$2,434,800 was Resource 2000 (bonding). During FY 82, revenue shortfalls necessitated a cut of \$1,750,000 in the state park development program, leaving \$5,292,800 in development funds. About one-half of the projects completed were handled by Park staff (force account). The balance of the projects were handled through DNR's Bureau of Engineering, with construction contracts.

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. Parks units will be aesthetically improved through extensive resource management programs for vegetation, wildlife, fisheries, and soils.

Examples of newly initiated projects include:

- * Flood warning system at Whitewater State Park.
- * Participation in Great River Road Program with projects in Itasca State Park.
- * Development of multi-use center at Afton 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 FY 81, a major rehabilitation of the Itasca State Park sewer system was completed. The entire park now operates with a central sewage system. All construction occurred in late fall and early spring, to keep interruptions of the park operation to a minimum.

The development of Afton State Park was completed in FY 82, with only minor construction remaining. The park interpretive center will be dedicated early in FY 83.

A very important element of the development program, as recognized in the park management plans, is the need for extensive vegetative management. This program has accomplished much over the past two years in re-vegetating many old farm fields within the state park boundaries.

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 \$6,278,600 -- plus \$2,267,900 from dedicated receipts. Thirteen new buildings (toilets, shelters, interpretive centers, etc.); 30 new recreation facilities (trails, picnic and camping areas, etc.); and 14 support facilities (shop, sewer, water, etc.) were added to the system.

The price of vehicle permits was increased July 1, 1981. These fees, along with camping fees and other park income, were dedicated to an operation and maintenance account for state parks. It was estimated that this account would generate \$2.4 million. Of this amount, the sum of \$870,000 was allocated to 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 six million. 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. Public information availability is an area that should be expanded.

New park managers received enforcement training to aid in the enforcement of park laws and rules. Park managers were brought into quarterly administrative meetings to participate in development of policy and other phases of the Division's activities.

The Division has held annual orientation training sessions in the parks for all field personnel who have contact with the public. As a result, the Division detects greater job satisfaction among employees, and fewer public conflicts.

Many parks lost numerous elm, oak and butternut trees to disease, leaving some picnic and campground areas without shade. Crews have removed most of the stricken trees, leveled the stumps, and have begun a shade tree replacement program.

Increased maintenance and operation costs, underfunded salary increases, and budget reduction to cover statewide deficiencies have made it necessary to reduce the primary operating season to a Memorial Day to Labor Day time frame. Although all parks remain open on a year-round basis, services have been reduced substantially and facilities closed down prior to Memorial Day and after Labor Day. In addition, many anticipated maintenance projects have been deferred.

Land Acquisition Program

During the Biennium 6,153.77 acres were acquired, 3,880.08 acres were a gift from NSP. This program is funded by the 1979-80 and 1981-82 bonding appropriations. These lands were in 16 state parks, statewide. The lands will be used to provide added public facilities such as camping, trails, picnicking and water access, and to enhance the aesthetics. The lands were acquired by gift and purchase.

Visitor Services

Visitor Services in the Minnesota State Park and Recreation System include both 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 concerning thoughtful use of the recreation resources. Through programs, signs and informational materials, Visitor Services provides direct assistance in the management of state parks, and helps minimize human impacts on fragile or over-used areas.

Interpretive programming in state parks stimulates increased enthusiasm, enjoyment and understanding of the park resources. 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 or informational material featuring historic, geologic or archaeological sites; and special events and programs for organized groups.

During the Biennium, Interpretive Services were available in 33 of the 65 state parks and recreation areas. A new interpretive trail center was opened at Sibley 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-round 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.

Seventeen 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.

Over all, more than 1.9 million park visitors came in contact with visitor services.

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TRAILS AND WATERWAYS

The Department's Trails and Waterways Program provides hiking, biking, snowmobiling, horseback riding and skiing opportunities along a system of trails; canoeing and boating on designated rivers; and the opportunity to use the public waters of the state through the development and maintenance of public accesses. These facilities contribute significantly to the health and social well-being of the user, as well as to the economic structure of the community.

The responsibility of providing overall management control is vested with a Special Assistant to the Commissioner. Fundamental field operations have been delegated to the Regional administrators, with considerable development and maintenance carried on by local units of government, and recreationally-oriented clubs through grants-in-aid and working agreements.

Trails Planning

This Section is charged with planning all state trails. It also reviews all other DNR unit plans, and comments on the trails and other related sections.

The Planning Section expended considerable effort preparing an overall State Trail Plan. Now in draft form, this Plan will guide much of the Department's future trails activity.

The master plan for the Minnesota-Wisconsin Boundary Trail was completed and approved during the Biennium. The master plan for the Root River Trail has been prepared in draft form, as has an update to the Heartland Trail Plan. A feasibility study of the Wild Indigo Scientific and Natural Area Trail in Mower County is nearing completion.

Also, the Planning Section completed an update of public trails on the SCORP Trails Inventory. Finally, many special reports were prepared on such topics as Volunteerism, Youth Hostels, 3-Wheel Drive Status in Minnesota, User Fees and Unre-funded Gas Tax.

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, and escalating land costs, have slowed the purchase of lands for recreational trails.

The focal point of the trails program during the Biennium has been away from new acquisition and toward the development and rehabilitation of existing trails. Only scattered parcels were acquired to provide contiguous trails.

Development

Development of trails during the Biennium was accomplished primarily on state trails; and there was some rehabilitation of trails in state parks and forests.

The development included 50 new miles of snowmobile trail on the North Shore; 72 miles rehabilitated or constructed on the Taconite; completion of 10 miles of new bicycle trail and 22 miles of horse trail on the Luce Line; and addition of 14 miles of snowmobiling on the Heartland.

Maintenance

Inflation and budget reductions during this period limited the ability to maintain the present trail systems. In fact, 200 fewer miles of snowmobile trails were maintained in FY 82, compared to FY 81. Therefore, with increased pressure on these systems by trail users, and funding insufficient to keep up with the demand, maintenance efforts during this period became less than adequate. If this trend continues, more trail closures will occur.

Minnesota Trails Assistance Program

The DNR has been delegated responsibility (by the Minnesota Legislature) to administer a cost-sharing program with local units of government for the development and maintenance of snowmobile trails. The 1981 legislation created a dedicated snowmobile account. Fees from the registration of snowmobiles, and the unrefunded gasoline tax attributable to snowmobile use, shall be credited to the snowmobile trails account. The money deposited in the account may be expended for snowmobile use only.

The program has been, and continues to be very functional in providing trail systems where there have not been any in the past; and connections between state trails, state park trail, state forest trails and local communities.

Currently, there are 6,300 miles of snowmobile trails receiving maintenance funding under the program. Additionally, 300-400 new miles will be developed in FY 83, providing vital connection hook-ups between existing systems.

The administration of the program has been decentralized to the extent possible. Where in the past the program was completely administered by the Central Office, the Regions now take a more active role.

The Saint Paul Office sets program policy, program guidelines, legislates for program funding, and allocates funding for new development and maintenance. Regional personnel are responsible for processing necessary program forms; providing technical assistance; monitoring trail development, maintenance and grooming; and conducting informational meetings with local organizations.

Water Access

The DNR operates 1,100 water access sites which 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 Metro Council and Department of Energy Planning and Development to provide access in the metropolitan area. Special task forces have been established on Lake Minnetonka and Prior Lake to provide a methodology for providing access on these lakes. Strong emphasis is given to cooperation with other governmental units to establish access. Special efforts have been made to publicize the availability of accesses, including publication and distribution of 35 county maps which show access locations, and media campaigns advertising newly-purchased and constructed access sites.

The 1982-83 appropriation for water access acquisition and improvement totaled \$2.7 million. In FY 82, there were 25 accesses acquired for about \$850,000. A total of 79 accesses were improved at a cost of \$700,000.

River Recreation

There are 18 legislatively-designated canoe and boating routes on Minnesota rivers. The River Recreation Section is authorized to acquire, develop and maintain river-oriented recreation facilities on the 18 rivers. These sites include rest areas, portage trails, primitive campsites and access locations. The program also includes preparation of maps, guides, manuals; water level and condition reports; and public informational services related to recreational use and enjoyment of rivers.

An extensive research project was completed on the lower Mississippi River, from the Twin Cities to the Iowa border. The entire area was surveyed, studied and mapped for canoeing and boating purposes. The main channel was mapped for power boating, while the back waters were mapped and marked for canoeists. This project received excellent response from the public, and has added nine new maps to the list of free material available to the public.

The River Recreation Program acquires, leases or uses (through agreements with private property owners) a total of 626 sites on the designated rivers. Four new sites were purchased this Biennium. Fourteen sites were developed. More than 100 sites were added to the list with the inclusion of the lower Mississippi.

There are now 40 individual maps for the 18 designated rivers. A new brochure was designed for the canoeing program, along with a new map order form. Another brochure showing the activities of the Trails and Waterways Unit was developed and is receiving excellent response from the public. Many hours have been spent in conjunction with the State Division of Tourism, promoting canoeing and other Trails and Waterways activities. More than 25,000 river maps were mailed to the public, along with 18,000 brochures and order forms.

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WATER RESOURCES MANAGEMENT

Minnesota Statutes mandate a water resources management program--in the interests of public health, safety, and welfare--for the wise use and development of the waters of the state. This includes more than 15,000 lakes and numerous wetlands, and 92,000 miles of streams and ditches, along with extensive underground water supplies. The purpose of the program is to allow reasonable use and development of the water resource, while preventing unwise use, resource deterioration or destruction. Functional program areas include:

- * Controlling by a permit system those activities which would alter streams, lakes, or protected wetlands; or withdraw significant amounts of water from surface or underground sources.
- * Inventorying the protected waters and wetlands throughout the state and compensating qualifying landowners through administration of state water bank funds for preserving wetlands protected under state law.
- * Controlling the construction, maintenance and operation of dams under statewide rules, and administering appropriated funds for reconstruction of publicly owned dams and hydropower feasibility determinations.
- * Guiding the development of shoreland and floodplain areas, including designated wild and scenic rivers, through adoption and administration of city and county ordinances meeting statewide standards.
- * Providing advice and assistance to local water resources management efforts, including the establishment, planning, and management of watershed districts and lake improvement districts; evaluation of public drainage projects; and administration of any available funds for stream channel maintenance and floodwater retention projects.
- * Conducting investigations and studies for the collection, analysis, and interpretation of technical facts on climate, groundwater, lakes, streams and wetlands; for use in management decisions within the Department, by other governmental agencies at all levels, and the public.
- * Developing data systems for efficient storage, retrieval, and dissemination of hydrologic data, water use compilations, permit information, and management policy.
- * Applying ever-developing water resources technology and innovative management concepts to complex Minnesota water problems, in order to enhance the efficiency and effectiveness of local, state and federal water resources management efforts.

- * Maintaining liaison and coordination with the Minnesota Water Planning Board and other state, interstate and national water program or project planning efforts, including drafting of legislative proposals and mandated state rules and amendments.

Division operations are conducted from the Regional and Area offices of the Department: Bemidji, Grand Rapids, Brainerd, New Ulm, Rochester, Thief River Falls, Fergus Falls, Detroit Lakes, Duluth, Cambridge, St. Cloud, Marshall, Spicer, Mankato; and the Central Office in St. Paul.

Development Section

Dam Safety Hydropower

Chapter 779, Laws of 1978 established a program for the inspection of dams to determine potential hazards to public health, safety and welfare; and the conditions of dams. This includes the inventory, characterization, classification, and examination of structural and hydraulic capacity.

Initial inspection of high hazard dams (which pose potential hazards to life, health and major property damage) was conducted in cooperation with the federal government, under a combined State and National Dam Safety program. In addition, 847 dams more than six feet in height were inventoried. Of these, an estimated 35 (four per cent) were in the high hazard class.

It is anticipated that approximately 30 to 35 new dams will be built each year, and these will be classified with respect to potential hazard. Construction will be monitored, inspected, and subject to permit and work approvals.

It is estimated that 67 permits will have been issued by the end of the Biennium.

During the Biennium, grants-in-aid funds assisted in financing the repair and reconstruction of the Kings Mill Dam in the City of Faribault, the Orono Dam in the City of Elk River, the Lake Byllesby Dam in Goodhue and Dakota counties, the Fishhook Dam in the City of Park Rapids, the Cold Spring Dam in the City of Cold Spring, and the Norway Lake Dam in the City of Pine River.

Chapter 885, Laws of 1980, authorized the Department to investigate and analyze hydroelectric generating capability of publicly-owned dams, in furtherance of the statewide objective to use existing dams for hydropower generation wherever it is found to be economically justified and environmentally sound. Hydropower feasibility studies, using state cost share money, were completed by the St. Anthony Falls Hydraulics Laboratory for the Anoka Dam, Thief River Falls Dam, Fishhook River Dam at Park Rapids, Lanesboro Dam, Kettle River Dam, Granite Falls Dam and St. Cloud Dam. Proposals are being sought or developed for hydropower retrofitting of Rapidan River Dam, Blue Earth County; Lake Byllesby Dam, Dakota and Goodhue coun-

ties; Kettle River Dam, Sandstone; and the St. Cloud and Granite Falls dams.

Protected Waters and Wetlands Inventory/State Water Bank Program

Pursuant to Minnesota Statutes 105.37, 105.391 and 105.392, the DNR is responsible for carrying out the Protected Waters and Wetlands Inventory Program. This program is intended to identify waters and wetlands subject to regulation under M.S. Chapter 105.42. The Department is mandated to carry out the inventory in coordination with the counties, with disputes and final resolution of designations through the establishment of a three-member hearing panel. As of October 1, 1982 the Division had completed the preliminary inventory of protected waters and wetlands in all counties. Final hearings for the designation of protected waters and wetlands will have been held in 77 counties by the end of FY 83.

Minnesota Laws of 1976, Chapter 83, established a Water Bank Program to compensate landowners for preserving wetlands in the State. This program resulted in the preservation of wildlife habitat; runoff reduction; floodwater retention; stream sedimentation reduction; and improved subsurface soil moisture, while supplementing and complementing the Federal Water Bank Program. Water Bank Program rules were promulgated in 1978. It is projected that, by the end of FY 83, approximately 80 landowners will be receiving compensation for protecting wetlands through the State Water Bank Program.

Protected Waters Permits

A total of 950 new applications for permits to change the course, current or cross-section of protected waters were received during FY 82, while 1,149 permits were granted or denied, significantly reducing the permit backlog. It is estimated that about 1,000 permit applications will be received while 1,150 permits will be granted or denied during FY 83.

By the end of FY 83, it is anticipated that revised Protected Waters Rules will be in effect.

Soil and Water Conservation District (SWCD) Liaison

Consistent with Minnesota Statutes, Chapter 105, the SWCD Liaison is continuing to develop a close working relationship between the Division of Waters and Minnesota's 92 Soil and Water Conservation districts in the administration of the Water Permits programs and increased involvement at this local level.

An intensive educational program was conducted to familiarize the SWCD's with the Protected Waters and Wetlands Inventory. Emphasis was placed on the important role that SWCD plays in each county, in determining which water resources appear on the final inventory map.

The SWCD Liaison was instrumental in setting up and coordinating a network of 237 observation wells in west central Minnesota measured by SWCD personnel. The Division of Waters and the Soil and Water Conservation Board are sharing the cost of this program. This additional data on groundwater supplies provides the Division's other programs with valuable information.

All activities with the SWCD's are closely coordinated with the State Soil and Water Conservation Board (SWCD), and the Minnesota Association of Soil and Water Conservation Districts (MASWCD).

Water Appropriation Program

The State exercises authority over "waters of the State" with respect to their use and appropriation for public water supply, irrigation, mining, and other purposes. Pursuant to Minnesota Statutes, Chapter 105, and Minnesota Code of Agency Rules, 6 MCAR Subsection 1.5050, the Division of Waters exercises the responsibility of implementing and administering the program.

Two hundred new applications for water appropriations were received in FY 82. The Division took final action on 294 applications, which included those carried forward from previous years. A major effort in FY 83 will be to bring under permit those users who were previously exempt from permit requirements but are now required to obtain permits.

The Division has become increasingly involved in the resolution of water allocation and well interference conflicts. Twelve major well interference conflicts were successfully resolved, without resorting to contested case hearings or judicial review. Conflict over the allocation of water from the Clearwater River has resulted in the development of an allocation plan which would be implemented during low flow conditions. The Division has initiated policy development on protected flows in streams, and protection elevations on lakes and wetlands, utilizing internal and interagency expertise.

An integrated planning process is being implemented to incorporate long term evaluation of groundwater and surface water supplies, and management plans for known sources. The development of allocation and management plans for identified critical water supplies has necessarily received the greatest attention. In cooperation with the Minnesota Department of Health and the Water Planning Board, the Division also is initiating and developing contingency planning procedures to assure suitable public water supplies during water shortage or contamination crises.

The development of new and revised permit and application forms, which will result in more efficient administration of the water appropriation will be completed by the end of FY 83.

HYDROLOGY SECTION

The Hydrology Section provides technical analysis, investigations and evaluations in the areas of ground water, surface water and climate, in support of Division programs. These activities, along with long-term monitoring of the State's water supply, generate data that are periodically tabulated and interpreted for publication in summary reports. Close coordination is maintained with the Health Department, Pollution Control Agency and Minnesota Geological Survey. Some larger studies are conducted cooperatively with the U.S. Geological Survey (USGS).

Ground Water

The Ground Water Unit activities during the Biennium included publication of: "Production Tests and Aquifer Tests" and "Hydrologic Effects of Quarry Dewatering on Dean Lake, Scott County - A Case Study". Another report, dealing with the groundwater resources of Lac Qui Parle County, has been prepared and is in review.

In support of the Division's groundwater management and appropriation permits program, 43 aquifer tests were conducted and/or analyzed and 371 groundwater technical evaluations were provided. These included appropriation permit reviews, well-interference complaint investigations, water-use conflict assessments, groundwater report reviews for Environmental Assessments and Impact Statements and they provided information in response to requests from the general public.

An information sheet for water well contractors and drillers was prepared to provide them with a better understanding of aquifer test procedures. In addition, several major groundwater projects were initiated or completed during the period. Test drilling and well construction was completed for ground water level monitoring, in conjunction with a seepage study at Carnelian Lake, Washington County, along with a similar project at Dean Lake, Scott County. A more general routine program of ground water and lake level monitoring was continued in the Minneapolis St. Paul metropolitan area. A field investigation and report were prepared for a public hearing dealing with the impacts of ditching in wetlands in Chisago County. Through funds provided by the Water Planning Board, a major project was completed, to develop and utilize ground water models for evaluating ground water flow systems.

These methods were presented to other agency personnel at three training sessions conducted during the Biennium.

Two continuing projects include the evaluation and revision of the statewide observation well network, and mapping and inventory of irrigation wells, together with the computerization of the resultant data. A special project was continued to evaluate and document the impacts of aquifer storage of natural gas by public utilities.

Technical support to other divisions of the Department of Natural Resources and to other agencies continued to be a major function of the ground water unit. This included technical review of data, prepared by the Waste Management Board, for siting of hazardous waste disposal facilities, and review of reports and advice and assistance to the Pollution Control Agency in ground water pollution issues.

A cooperative agreement with the USGS to study the ground water resources of the State continued. The following ground water studies were in progress during the period.

Upper Pomme de Terre-Chippewa River areas: Grant, Stevens, Pope and Swift Counties.

Pelican River Sand Plain: Otter Tail, Becker and Clay counties.

Sand Plains area in Carlton, Pine and Kanabec counties.

Water-Quality Assessment of Sand-Plain Aquifers in West-Central Minnesota.

Big Marine Lake, Washington County.

Minnesota portion of the National Water Use Data Base System.

Surface Water

The Surface Water Unit processed about 50 hydrologic and/or hydraulic analyses in providing technical assistance to other sections of the Division and regional Division staffs; the Divisions of Fish and Wildlife, Parks and Recreation; the Office of Planning, and the Bureau of Engineering.

Some examples of the specific types of these efforts include:

- * Evaluations of flooding in the City of Waterville, Minnesota, due to proposed ditch project on Whitewater Creek.
- * Flood hazard evaluation on the group camp at Beaver Creek State Park, Houston County.
- * Evaluation of Lake level fluctuations; - Chisago chain of lakes, Chisago County.
- * Hydraulic Design of Emergency Spillway for Cranberry Wildlife Management Area, Isanti County.
- * Hydrologic and hydraulic design for Spruce Center Dam, Douglas County.
- * Runoff estimations for the upper Minnesota River tributaries.

- * Hydrologic evaluation of the impact on Smiley Lake, Meeker County due to a bypass ditch.
- * Flood hazard evaluation on Fort Ridgely State Park, Nicollet County.
- * Hydrologic and hydraulic study of Baker Lake outlet structures, McLeod County.
- * Evaluation of a substantial number of floodway modifications in connection with previous flood insurance studies.

In the first year of the Biennium, data collection was continued as part of a continuing project at Williams Lake, Hubbard County, to evaluate and model surface water-ground water relationships as part of the DNR/U.S.G.S. joint funding agreement. Money was allocated and a substantial amount of data collected under this agreement, to further study the hydrology of Big Marine Lake, Washington County, but funding reductions have reduced or eliminated work on these projects.

A two-part study dealing with low flow characteristics in Minnesota streams was also completed. The results were published in Division of Waters publication, Technical Paper No. 9: "Technique for Estimating 50, 85, 90 and 95 Per Cent Exceedance Flows in Duration Table of Daily Flows at Ungaged Sites of Minnesota Streams, Part II: Ungaged Sites," January 1981.

The Surface Water Unit conducted an in-house, three-day training session for 33 staff members on basic hydrologic and hydraulic concepts, including modeling and its applications.

The staff continued to evaluate the existing streamflow gaging network in the state in cooperation with the U.S.G.S. A new concept of streamflow data collection system involving a "total watershed concept", has been planned for the Cannon River watershed, for implementation subject to availability of funds.

With respect to surface waters of interstate and international concern, the Surface Water Unit contributed technical expertise to the formulation and writing of the document: "Red River of the North Modeling Evaluation, Report to International Souris-Red Rivers Engineering Board" (September 1982).

Climatology

The State Climatologist's Office maintains, analyzes and disseminates climatological data from all sources in the state. Seven local networks, as well as the National Weather Service, contribute data to the Climatologist. From the data, the State Climatologist routinely prepares for public release, maps of: intense summer storms, weekly and monthly precipitation, snow

depth and lake ice conditions. Typical examples of predicative data on climatic conditions include: prediction of spring ice-out conditions, for the Fisheries Division; forest fire susceptibility conditions for the Forestry Division, based upon soil moisture and climate conditions; and various assessments for agriculture, such as projected energy demand for crop drying, and potential moisture stress areas. In addition, assessments of crop damage due to intense storms were developed.

During the Biennium, work was completed on a preliminary assessment of the relationship of climatic factors to flooding in the Red River Valley. Continuing efforts are underway to verify the relationship of various climate variables, (especially soil moisture) to streamflow, lake levels and ground water levels.

"Climate of Minnesota: Part XIII - Duration and Depth of Snow Cover" published during the Biennium by the University of Minnesota Experiment Station as part of a continuing series on the climate of Minnesota. The State Climatologist was the senior author.

Data Systems

The Climatology Office is continuing to update files of climatological data utilizing computer systems.

FLOOD PLAIN and SHORELAND MANAGEMENT SECTION

Flood Plain Management

During FY 82 and FY 83, the Flood Plain Management Unit continued efforts to obtain detailed technical data for flood-prone communities, and assisted those communities in adopting flood plain management regulations.

There were approximately 200 stated-approved local flood plain management ordinances at the end of FY 81. An additional 45 local flood plain ordinances were adopted in FY 82 and it is expected that an additional 35 ordinances will be adopted in FY 83.

With the advent of successful adoption of flood plain ordinances in major flood prone communities, increased attention is being placed on other aspects of flood plain management. The evolving state-of-the-art for comprehensive flood plain management stresses the importance of flood plain regulations, as an important element of the program, but it also emphasizes that these regulations should be included within an array of activities in an overall community flood plain management program. Therefore, during the Biennium, greater emphasis was placed on public information and education, flood hazard mitigation planning, flood forecasting and flood warning, and flood emergency response and recovery planning.

As more flood plain ordinances have been adopted, the Flood Plain Management Unit has provided increased amounts of technical assistance to local officials to enhance local ordinance administration. This technical assistance, and a number of other program activities, have been partially funded through Minnesota's State Assistance Program (SAP) contract with the Federal Emergency Management Agency. One major SAP task during FY 83 is to develop a strategy to determine the most suitable regulatory approach for the remaining 150 marginally flood-prone communities that have yet to adopt flood plain regulations.

Other program efforts during the Biennium included training of local officials and planning/zoning staff; development of a data base to store all relevant flood data and to make the data available to local officials; development of a monitoring program to determine the effectiveness of community regulatory programs; implementation of local flood forecasting and flood warning systems, and development of numerous informational brochures.

Shoreland Management

During the Biennium, approximately 150 communities were provided assistance in the administration of adopted shoreland management controls, and 5,000 citizen inquiries for information about the program were also handled. Proposed amendments to the shoreland control regulations of six counties were reviewed for continued compliance with state standards. Shoreland controls were adopted by 21 cities, and an additional 15 cities submitted proposed controls for review, bringing the total number of cities with controls meeting or exceeding state standards to 65. Four training sessions for local officials and several for DNR field staff were held.

The shoreland update project has accomplished two major objectives. It has updated and expanded the state inventory on lake and river resources and development and has evaluated the effectiveness of shoreland management efforts.

Wild and Scenic Rivers

During the Biennium, ten local units of government on designated rivers adopted required land use controls. This concluded the ordinance adoption process which brought to 43 the total number of communities which have adopted adequate controls. Three additional rivers were studied and a resource analysis report prepared. Community audits to evaluate implementation of adopted controls were performed for 15 communities and 74 per cent of designated river miles were monitored to evaluate overall implementation and effectiveness of the program. Approximately 350 requests for technical assistance and 250 general requests for information were handled.

Lower St. Croix National Scenic Riverway

Numerous local government land use decisions have been reviewed and certified. More than 20 Lower St. Croix River Technical Committee meetings were attended and coordination with Wisconsin and several federal agencies was provided on such matters as annual administration of water surface use controls, involvement in the hearing process for a large marina project proposal, and a comprehensive evaluation of desirable adjustments to the Riverway boundary.

Special Projects Review

The Division (pursuant to M.S. Chapter 106) is responsible for reviewing and advising county ditch authorities on the adequacy and completeness of engineers reports for establishment of county ditch systems. During the past two years, 108 public drainage system projects were reviewed and Commissioner's reports were filed with the sponsoring counties. Several of these projects involved preparation of extensive environmental impact statements.

This activity also included the review of 41 watershed district projects and the filing of Director's reports advising the sponsoring districts as to completeness and adequacy. The projects involved various activities including dam construction, drainage and urban flood controls.

Environmental Review

The Division evaluated approximately 340 documents involving environmental assessments and impact statements for consistency with DNR water resource policy and regulations. The Division also prepared a state environmental impact statement on the Roseau flood control project, and an environmental assessment on the Moose River flood control/wildlife impoundment.

The Section also provided information and technical advice to individuals involved in environmental document preparation.

POLICY and PLANNING SECTION

The Policy and Planning Section has a major role in the development and integration of water resources policy within the Division, in order to provide for coordinated management of the water resources of the State and in coordination of the review analysis and comment on governmental water projects in the State.

Other significant responsibilities involve analyses of internal Division programs; interdivisional program coordination; assistance in the revision of the State's Framework Water and Related Land Resources Plan; and providing advice as needed on water resource matters in the State's role in interstate commissions or organizations.

During the Biennium, the Section coordinated the analysis and assembly of comments on a number of Federal public works projects and activities. This included involvement in major basin studies dealing with the re-initiation of the St. Croix River Basin Feasibility Study, and the completion of the Iowa-Cedar River Basin Study. Involvement continued in flood control projects of: the Minnesota River Basin 639 Study Area; Rochester; Twin Valley; East Grand Forks; Halstad; Chaska; Saint Paul; and the Roseau River, with coordination of the DNR's position from various disciplines. In addition, other water projects relating to harbor improvements in Duluth-Superior, Warroad and Lake City were conducted with interdisciplinary review and coordination. The Section provided inputs in Section 22 wetland evaluation projects, and coordinated the completion, by a consultant, of the "Water and Related Land Resources Management Study for the Heron Lake System".

Section staff was involved in the multi-state-federal study which produced the "Master Plan for the Upper Mississippi River System" under the direction of the Upper Mississippi River Basin Commission. This included considerable inputs to the "Environmental Studies Section" of the "Master Plan", which is presently being considered by Congress.

In addition, the Section coordinated multidisciplinary DNR involvement in the continuing U.S. Corps of Engineers (U.S.C.E.) "Upper Mississippi River Land Use Allocation Plan" dealing with the allocation and use of federally-owned U.S.C.E. and U.S. Fish and Wildlife lands in the Upper Mississippi River system.

Section staff were involved in expanded efforts to better develop and utilize computerized data systems for water resources management.

The Section continued its liaison efforts with the Legislature and provided review, comments and summary data on proposed and existing water resources legislation during the Biennium.

Other significant efforts included the Division's internal analysis of management and resource issues, in conjunction with the Department's Office of Planning. This project involved the acquisition of opinions on about 415 issues, and concerns obtained from Division staff. Within the Department, the Section's role in the Division's efforts to improve communications between divisions, and resolve differences over project activities, consumed substantial time.

The Section continued to represent the Division and Department on various committees of the Water Planning Board during the Biennium. The Section provided considerable analysis and communication with the Corps of Engineers in FY 83 particularly with respect to issues of dredging and administration of Section 404, in order to resolve differences with respect to federal-state jurisdictions, permitting requirements and elimination of duplicative efforts.

The Policy and Planning Section also continued to represent the Division and Department on the Great Lakes Commission, as well as on other interstate bodies where such emerging issues as interbasin water transfers and navigational concerns were addressed.

Hydrographic Unit

During FY 82, a total of 95 Hydrographic Requisitions handled by the Unit resulted in surveys being conducted in 39 counties involving all DNR regions. The majority of these surveys involved hydrologic, hydraulic, and topographic conditions around protected waters of the State. Many of the requisitions included gathering data for Natural Ordinary High Water determination, and determining run-out and control levels of protected waters. Graphic support for this effort included 41 topographic drawings, and more than 50 graphs and charts to assist in water resource management decisions.

A total of 156 inspections were conducted at state-owned dams. These inspections included data collection, adjustments, minor repairs and/or preventive maintenance, as required. One contract was let for reconstruction of a state-owned dam, at a cost of \$14,606. Another reconstruction project from FY 82 funding, is pending.

The Unit continued to administer the Division's statewide lake gaging program to monitor lake level elevations at 54 temporary stations and 49 permanent stations. In addition, the Unit utilized data from 42 stations monitored by other agencies in its data system. The conduct of this activity includes establishing stations, providing precise leveling to "zero" (equating gage readings to sea level datum) gages, obtaining observers, and the securing and recording of stage records.

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REGIONAL ADMINISTRATION

Regional Administration is the key element of the Department's field operations throughout the state. For organizational management and administrative purposes, there are currently six geographic regions headquartered in Bemidji, Grand Rapids, Brainerd, New Ulm, Rochester and St. Paul. It is through these regional offices that DNR programs are administered and the general public is served.

Regional administrators, who provide leadership for the six regional resource management teams, were designated early in the Biennium to represent the Department on Protected Waters Inventory hearing panels in each of Minnesota's 87 counties. To date, some 75 counties have completed the process, resulting in the first detailed and complete mapping of protected wetlands, water basins and watercourses in the state's history.

As of July 1982, Soil and Water Conservation District Representatives were transferred out of the Department of Natural Resources into the Department of Agriculture, eliminating one regional office service to the public.

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

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 perspective that would not otherwise be possible. Regional administrators, along with the regional discipline supervisors, are in the business of managing the people who manage natural resources. 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, in recognition of the fact that one resource management action may impact another, consideration must be given to both wildlife and forestry concerns before a specific management technique can appropriately be recommended; fisheries management must work hand in hand with water management if the greatest public good is to be served; actions for parks, trails, and water recreation management must be coordinated to best serve the needs of outdoor recreation facility users.

Regional Administrators regularly deal with concerns which are peculiar and unique to their own geographic areas: public access to Lake Minnetonka in the Metro Region, agriculture and wildlife in the southwest, Memorial Hardwood Forest acquisition and management in the southeast, Indian affairs and land administration in the northwest, tourism in the central region and Voyageur's National Park and BWCA in the northeast. While controversies and clientele continually change, the need for an overall, interdisciplinary, Department-wide perspective continues to be extremely important.

Regional Administration provides equally important functions in terms of administrative services, which make it possible for resource managers to administer programs rather than paperwork.

Business management activities include bill paying, purchasing supplies and processing of personnel documents at the regional level. During the Biennium, the Department decentralized its high payroll procedure, reducing pressure on the Central Office and improving efficiency and accuracy. 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 in order to best serve the regional organizational structure and its resource managers.

Information dissemination and educational efforts are also important components of the regional administration staff function. As state government experiences repeated budget and staff cuts, there will continue to be an increased need to keep the public informed of the programs, facilities and policies its tax dollars are funding. The Biennium has been marked by the DNR's expanded awareness of the need to assist in energy conservation efforts by informing citizens about the public recreational opportunities which are available to them close to home. Public information services will undoubtedly continue to play an expanded role as the complexity of natural resource problems and programs increase. An educated citizenry is the best support possible for sound management practices.

A legislative action that could significantly impact field operations of the DNR occurred during the 1982 legislative session. As a part of a budget cutting effort, the legislature directed the closing of the metropolitan regional office and requested the preparation of a plan to further reduce the number of regional offices to three, for consideration at the 1983 legislative session. The Department has responded to that directive by conducting a detailed analysis of its field operations at the regional level and is currently developing the requested report for consideration at the 1983 legislative session. In the interim, the Department has funded the continued operation of the metropolitan regional office for the majority of Fiscal Year 1983, pending legislative review of the Department's plan.

ENFORCEMENT

The Division of Enforcement functions to protect the state's natural resources from abuse and depletion. Conservation officers protect public lands, parks, timber, waters, wild rice and wild animals by enforcing natural resources laws, rules, regulations, and Commissioner's Orders.

Enforcement is accomplished by effective 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 firearms and snowmobile safety. Officers are required to participate in continuing training programs to maintain a state license, keep abreast of major changes and be advised of new enforcement techniques.

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

The Division's objectives are: to fairly and effectively enforce all laws, orders, and regulations administered by the Commissioner of Natural Resources; to promote safe use of watercraft, firearms, all-terrain vehicles and snowmobiles, without adverse effect on the natural resources; to preserve Minnesota's resources for the pleasure and safety of the public, through educational programs and anti-litter law objectives; to protect Minnesota's water resources by regulating surface use appropriations, diversions and the changing of cross sections, to assure that a continuous supply of uncontaminated water is available to the public and wildlife.

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

Arrests and Confiscations

The A and C Unit is responsible for the record keeping of all arrests and confiscations, and the sale of all perishable items. This unit holds an annual sale of all furs confiscated throughout the year, an annual sale of all firearms and miscellaneous equipment confiscated, and a sale of all traps confiscated.

This Unit is also responsible for all monies collected from a sale of the above mentioned items, and the sale of all perishable items and confiscated vehicles.

Receipts for items sold in 1981 and 1982 were as follows:

<u>Items:</u>	<u>1981</u>	<u>1982</u>
Traps	\$ 1,566.60	\$ 976.50
Furs	No Sale	\$26,411.20
Guns	\$31,461.81	\$28,497.75

The following is the 1980/81 summary for all other confiscations:

<u>DEER</u>	<u>1980</u>	<u>1981</u>
Car Killed	8,649	11,749
Illegally Taken, Shined or Poached .	732	489
Killed by Dogs	46	59
Diseased or Crippled	317	221
Taken Doing Damage	3	9
Miscellaneous.	<u>24</u>	<u>26</u>
Total Reported Deer Kills	9,771	12,553

<u>MOOSE</u>	<u>1980</u>	<u>1981</u>
Car Killed	45	72
Illegally Taken, Shined or Poached .	15	33
Diseased or Crippled	7	15
Taken Doing Damage	1	0
Miscellaneous.	<u>0</u>	<u>2</u>
Total Reported Moose Kills. . . .	68	122

<u>BEAR</u>	<u>1980</u>	<u>1981</u>
Car Killed	35	47
Illegally Taken, Shined or Poached .	19	39
Taken Doing Damage	35	5
Diseased or Crippled	2	226
Miscellaneous.	<u>3</u>	<u>3</u>
Total Reported Bear Kills	94	320

Safety Training

During the Biennium there were 20,489 youth certified in firearms in 1981 and an estimated 20,500 in 1982. A total of 3,880 youth were certified for snowmobile operation in 1981 and an estimated 3,500 in 1982.

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 both small and big game. This will necessitate increased youth training in handguns.

To date, more than 540,000 youth have been trained in firearms and 200,000 in snowmobile safety since the programs were initiated.

There currently are 3,775 firearm safety instructors qualified and certified to instruct the youth of Minnesota. It is anticipated that this number will remain constant.

These instructors represent a 100 per cent volunteer corps and are to be commended for a successful program that has been the model for most other states conducting similar programs.

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 resource products.

The Special Investigations Unit responds to information and complaints involving illegal activities. When uniformed personnel so require, DNR Regions request assistance from the Unit.

The Unit cooperates with the U.S. Fish & Wildlife Service and state investigative agencies regarding the commercialization and illegal interstate transportation of game and fish. The Special Investigations Unit assists in the training of uniformed officers in undercover operations and the latest investigative techniques and legal approaches governing this type of function. 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, non-profit 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.

During its first month of operation (September, 1981) TIP phone calls totaled 312, resulting in 18 arrests. In its first 1½ years of operation, more than 2,400 calls were received, resulting in 282 arrests.

The following is a summary of TIP activity from September, 1981 through June, 1982:

	<u>1981</u>	<u>½ 1982</u>	<u>Total</u>
Total Calls	1,866	600	2,466
Calls Referred to Field Officers	351	77	428
Arrests Made by Officers	221	61	282
Rewards Paid	74	40	114
Amount of Money Paid Out	\$10,875	\$5,825	\$16,700

Although \$16,700 in awards has been paid out to TIPsters since September, 1981; about 66 per cent 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.

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>1980</u>	<u>1981</u>
Fishing	4,246	4,675
Trapping.	241	178
Game Farm	3	3
Fur Dealers	6	5
Littering and Polluting	181	193
Change Cross Section of Lakes	25	39
Trespass on Agricultural and/or Posted Land	65	52
Wild Rice	53	150
State Park.	261	223
Unauthorized Burning.	46	9
Resist, Hinder Conservation Officer	27	15
Hunting	1,578	1,943
Uncased/Unstrung Weapons.	1,307	1,400
Snowmobile.	817	470
Watercraft.	1,622	1,409
Miscellaneous	_____	16
Total Convictions.	10,478	10,782
Juvenile Court Cases.	56	56
Dismissed, Not Guilty	236	269
Total Arrests	10,770	11,107
Dismissal Rate.	2.5%	2%
Reports of Juveniles.	231	171

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. It has been estimated that the illegal taking of game and fish has been increasing in Minnesota.

To curtail these illegal activities, 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 and project 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 legal harvest for honest sportsmen.

* * *

PLANNING

The Office of Planning provides the Commissioner's Office and the DNR operating divisions with expertise and assistance in the areas of resource policy development, management analysis, productivity improvement, data management and analysis, site planning, and environmental impact analysis and document preparation.

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

Research and Policy

Major recent accomplishments of the Research and Policy Section include: implementation of the State Comprehensive Outdoor Recreation Plan (SCORP); transfer of the Natural Heritage Program to the Section of Wildlife; completion of detailed policies for state recreation units; initiation of a long range planning process in the Division of Waters; and initiation of a long range land resource plan for state lands.

The State Comprehensive Outdoor Recreation Plan emphasized needs for more public access, more primitive camping, better monitoring of recreation use, and better programs to inform the public of outdoor recreation opportunities. Significant progress has been made in each of these areas.

The public access program has been accelerated, and priorities developed around SCORP guidelines. Accelerated funding for the forest recreation program (following SCORP guidelines) has been given tentative approval by the Legislative Commission on Minnesota Resources (LCMR).

The Trails and Waterways Unit, with technical support from Research and Policy, has instituted a user monitoring program on state trails. In addition, State park campers are being sampled on a continuous basis to better predict use patterns.

Significant progress has been made in informing the public of potential outdoor recreation opportunities. The public access map developed with Trails and Waterways has been expanded to include all major lake region counties. A major tourism proposal that will update the private outdoor recreation facility portion of the SCORP inventory, and make public and private facilities information available at computer terminals at key tourism stops, has been approved by LCMR.

The Natural Heritage Program developed in the Research and Policy Section has been continued and transferred to the Wildlife Section. The program is now operational, and the transfer assured its continuity and effectiveness.

The Research and Policy Section, through the use of department-wide task forces, has developed policies governing the management of natural and recreation State parks, Wildlife Management areas, State trails, public water accesses, scientific and natural areas, State Forest recreation areas, and Forestry wildlife coordination and rivers management.

The Division of Waters, utilizing the staff of the Research and Policy Section, has been developing a long-range plan. The plan has defined waters issues, and Division task forces are now using a broad based participative management approach to develop approaches that address the issues.

The Research and Policy Section, utilizing DNR Division task forces and the Minnesota Land Management Information System data base, is developing a long-range land resource plan for state lands. The principal goal of the study is to assess the relative quality of state lands for each of the land uses that reasonably can occur on them. This information can then serve as a basis for land allocation and refinement of management boundaries.

Rivers Planning

During FY 81 and FY 82, Rivers Planning has been coordinating the implementation of the six river management plans for Minnesota's Wild and Scenic River System. These plans manage and protect the rivers and adjacent lands through locally administered zoning ordinances, recreation management and limited land acquisition to protect unique parcels of natural river frontage (scenic easements).

Personnel from this program have also participated in a finalized river management policy for the Department; completed the first comprehensive inventory of the state's river resources; administered a Legislative Commission on Minnesota Resources' (LCMR) grant to the Mississippi Headwaters Board; coordinated the state's involvement in the development on an alternative management plan and special legislation for a segment of the Minnesota River; and completed resource analysis for the Zumbro and part of the Crow rivers.

Informational materials concerning river values and protection, and designed for classroom use, were developed and distributed to school teachers throughout the state.

Parks Planning

During FY 82, management plans for ten state parks were initiated. These include collection of information on natural resources, park development, and current use. Eleven related major public meetings and numerous task force and group meetings were held.

Two management plans were completed by Parks Planning during the fiscal year, and approved by the Department of Energy, Planning and Development: Bear Head Lake and Sakatah Lake.

In FY 83, Lake Louise, Rice Lake, Upper Sioux Agency, Fort Ridgely, Crosby Manitou, Temperance-Cross Rivers, and Big Stone Lake state park plans will be in progress.

Forty-two management plans are now complete and approved by the Department of Energy, Planning and Development in accordance with the Outdoor Recreation Act of 1975.

The Comprehensive Plan for the Minnesota Valley National Wildlife Refuge/Recreation Area and State Trail was drafted and is being revised, prior to public and agency reviews.

Environmental Review/Environmental Quality Board

The Environmental Review activity is the focal point within DNR to review and assess public and private development projects, land or water use proposals, and plans before they are implemented. This is accomplished by providing a standard predictable process; taking into consideration the points of view of various natural resource disciplines (Waters, Fish and Wildlife, Forestry, Parks and Recreation, Minerals, and Enforcement); whereby balanced Departmental documents and policies are produced. A related function involves developing position papers, usually in letter form, commenting on projects and plans generated from outside the Department. Through interdisciplinary and interagency cooperation, the environmental review process checks unnecessary environmental degradation. This ensures that implementation of projects, proposals, and plans proceeds in a coordinated and timely manner; while establishing adequate environmental safeguards, through such activities as governmental permitting and construction.

During the Biennium, more than 250 federal, state (non-DNR), local, and private projects and plans were reviewed, and several environmental impact statement (EIS) documents were prepared and/or reviewed.

The Department's review process focuses on six major issue areas:

- * Energy -- including power plants, transmission lines, and pipelines.
- * Waste Processing and Disposal -- including hazardous waste, solid waste and sewage sludge.
- * Mining -- including iron ore, peat, sand and gravel, limestone, copper-nickel, and uranium.
- * Public Waters/Wetlands -- impacts on surface and groundwater hydrology and fish and wildlife, resulting from various types of development.

- * Natural Resources Management Units -- policies and plans for State forests, State parks, wildlife management areas, and scientific and natural areas.
- * Recreational Resources/Facilities -- policies and plans for trails, lakes, rivers, and public accesses.

The DNR review process in these major issue areas and related, site-specific project proposals; continues to make a significant contribution toward fulfilling the Department's responsibility for preserving, protecting and wisely utilizing the State's natural resources.

Federal Aid Coordination

During the Biennium, the Federal Aid Section administered, and enforced compliance on 398 Land and Water Conservation Fund (LAWCON) projects.

The Section had two projects and 41 project amendments approved; completed 27 projects; obligated \$1,875,682.13 (federal share); submitted 74 billings for reimbursement; deposited \$4,776,010.88 of federal matching funds in the Natural Resources Federal Reimbursement Account; and collected \$267,520 of Contingency Reserve money for the Hennepin County Park Reserve District.

* * *

INFORMATION and EDUCATION

Responding to Minnesota citizens' right and need to be informed about Department of Natural Resources management policies, plans, programs and services is the overall responsibility of the Bureau of Information and Education.

Bureau functions include the legislatively mandated Environmental Education and Boat and Water Safety programs.

In addition to general public informational obligations, communications emphasis is placed on:

(1) the diverse recreational opportunities offered by DNR managed lands and public waters;

(2) serving clientele including thousands of sportsmen; sportsmen's clubs, conservation and environmental organizations; professional and youth groups; teachers, safety instructors, DNR disciplines and appropriate state-federal agencies.

Mass communications include releases to newspapers, television, radio and information-oriented publications; as well as providing prompt responses to media requests for information, interviews or contacts with DNR personnel.

The Bureau produces special publications designed to respond to public informational requests.

Increased emphasis has been placed on programs designed to encourage citizen participation, as well as citizen involvement, in the Department's decision-making processes.

Communications services are provided for the highly successful TIP, Inc. (Turn in Poachers) program. This program combines private sector funding, a citizens board of directors, and the commitment of the DNR's Division of Enforcement toward a mutual goal: protecting Minnesota's fish and wildlife resources.

The Bureau assists in planning, and serves to coordinate annual migratory waterfowl and trout stamp competitions; plans stamp design for winning entries and arranges for printing stamps required by the DNR License Center.

Bureau Sections and responsibilities:

News Section

Prepares and distributes news releases for use in 372 Minnesota newspapers, all radio and television stations, and other mass communications enterprises (magazines, specialized publications).

A weekly five-minute radio program is utilized by more than 40 Minnesota stations; and radio spots are prepared for special informational needs: fire hazards, recreational trail conditions and facilities, fish and wildlife seasons.

An annual average of 409 news releases are distributed to the media. The news section also schedules press conferences and provides for other specialized informational services; including supervising the State Fair conservation building and grounds maintenance, and chairing the DNR State Fair Committee.

Publications Section

Responsible for editing and distributing the DNR's official magazine, The Minnesota Volunteer, circulated to 80,000 subscribers (readership index: 350,000). The "Volunteer" enjoys exceptional public support, is used extensively in school classrooms, and is circulated to all school and college libraries to ensure optimum readership.

Periodic reviews of the Volunteer subscription list are conducted to assure accuracy of subscription files.

Budget constraints precluded preparation of any new, general publications. Rather, publication efforts were confined to reprints of priority publications: DNR Reports, Snowmobile Safety Laws, Minnesota Facts and Figures, Film Library Catalogue.

A DNR Publications Liaison Officer is provided by this Section for review and assistance in the preparation of more than 350 DNR printing requisitions, annually. In many instances, cost and time-saving procedures are implemented as a result of this service.

This Section also provides editorial assistance to DNR disciplines in publications preparation, and is responsible for responding to thousands of mail, telephone and walk-in requests for informational publications, annually.

Environmental Education Section

The Conservation Education Act of 1976 (Sec. 84.025, M.S. 1976, Sec. 126.111) and the enabling Legislative Act of 1978, gives the Bureau primary responsibility for developing and conducting education programs for school-age children and adults in the areas of Outdoor Education/Recreation, Natural Resources Education, and the Minnesota Advanced Hunter Education program.

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

Since the inception of the education program (1970), more than 50,000 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, special outdoor leadership training sessions for outdoor educators and for adult hunters who may participate in 16-hour classes, two-hour clinics or one-day seminars.

Since 1970, these environmental education programs have received one first place, two second place and one third place in international awards competitions.

Audio-Visual Section

Produces photographic services for all DNR disciplines, DNR Regions, and media; produces audio-visual aids for educational programs, and public appearances by DNR personnel.

The Bureau photo lab handled more than 700 service requests during the Biennium, including film processing, print processing, enlargements, proof sheets, copy work, special photo techniques, etc., for Bureau clientele.

The I&E Bureau would normally produce 13 half-hour public service T.V. programs per year, but due to severe budget cut-backs, only three programs were produced in this Biennium. Twelve 10- and 30-second spot announcements covering subjects relating to law enforcement, parks, trails, fisheries and the TIP (Turn in Poachers) program were produced in this Biennium, and aired by six commercial television stations, and three satellite outlets that provide statewide coverage for resource information.

The I and E Bureau Film Loan Library distributed 9,500 resource-related film loan titles that were viewed by more than 700,000 persons during the Biennium.

Boat and Water Safety Section

This Section coordinates the boat and water safety activities of the Department; including liaison with the U.S. Coast Guard, other states, other state Departments, counties, and public and private safety groups, as well as 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 51,000 teenagers. During FY 82, approximately 4,000 students were issued operator's permits. (Note: This course was certified by the National Association of State Boating Law Administrators, and officially recognized by the U.S. Coast Guard during 1980.)

Other activities during the Biennium included:

- * Distribution of approximately 100,000 pieces of general boating safety information; plus printing 200,000 copies of the Boating Guide (law synopsis) and 5,000 copies of the exact statutes and rules, each year.
- * Displays at two Twin City sport and boat shows each year (average attendance: 275,000/yr).
- * Twenty-two issues of the Boat and Water Safety Newsletter published and circulated (500 copies per issue).
- * Training sessions conducted for 33 county sheriff's departments (327 deputies); 32 DNR conservation officers; 225 Emergency Medical Technicians/Paramedics; 20 Coast Guard Reservists; 73 firemen; 20 U.S. Fish and Wildlife Service Officers; 25 State Patrol troopers, and 20 U.S. Forest Service officers.
- * Informed public on boat and water safety through press releases and feature stories, magazine articles, radio and TV interviews, and public speaking engagements.

The Boat and Water Safety Section also cooperated with the Minnesota Pollution Control Agency in motor boat control program; reviewed water surface-use ordinances for three counties and six cities; developed and implemented new formula for disbursement of county sheriffs' boat and water safety funds (\$1 million per year), based primarily on performance and water usage.

* * *

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 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, developing 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." (Minnesota Statutes, 1974, Sec. 116E.01)

The Board and its 13 regional councils meet these changes by initiating education and information programs on environmental issues important to those regions; by cooperating with and assisting other agencies and organizations who 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 185 volunteers. The state board membership includes one representative from each of the regional councils, and six at-large members appointed by the Governor. The board and councils are served by a staff composed of an executive director, three regional coordinators, and two 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, Natural Resources; the Pollution Control Agency; Agriculture Extension Service, and the United States Soil Conservation Service.

Services Offered

The Minnesota Environmental Education Board volunteers serve as 200 additional lines of communication in all regions of the state that have been effectively used by 36 major state and federal agencies, plus numerous local and county groups. These groups are MEEB's primary clients, especially in an era of cut-backs when the usual "information and education" staffs have been even more restricted by lack of funds to get pertinent information to the general public.

Architects, teachers, children, people interested in reducing energy bills, citizens concerned about acid rain, pre-school "nature nuts", hunters, farmers concerned about organic farming and crop pest management, local county and elected officials, private forest owners; these are just a few of the Minnesota Environmental Education Board clients.

During the Biennium, the Minnesota Environmental Education Board produced such products as:

* Acid Rain Public Education (M.S. 1980, Chap. 490): Minnesota Environmental Education Board volunteers and five staff coordinators reached 500,000 people with information about acid rain during 1980. This program continues to update Minnesota citizens on this issue. The Minnesota Environmental Education Board is an active member of the State Acid Rain Task Force.

* Radio Tape Series: "Your Own Backyard", a 15-minute weekly broadcast on topics such as acid rain, hazardous waste, energy audit, non-game wildlife, and wood residue as fuel. This series reached 75,000-100,000 Minnesotans each week from January to June, 1981. Thirty stations carried the programs and are anxious to receive new materials in the series. Some continue to broadcast programs generated in 1981, because they are still of general interest and importance. Cost - \$4,878. Value - \$91,948 (figure from budget of grant application to the Minnesota Humanities Commission).

* TV Programs: "Who Controls the Fate of Minnesota's Forests?" done in cooperation with the Department of Natural Resources' Division of Forestry, and Staples Area Vocational Technical Institute (AVTI); a thirty-minute television program broadcast (from Alexandria) to 62,000 homes. This covered the opportunities and responsibilities of the owners of small private forest areas. A South Dakota forester saw this program and requested a print so he could bring the South Dakota Department of Natural Resources forestry section the idea for replication there. Cost - \$1,500. Value in excess of \$15,000 (estimate by Staples AVTI).

Other relevant statistics include the following:

	<u>FY-81</u>	<u>FY-82</u>
Programs	263	143
Participants	31,842*	10,260
Cooperation with Other Agencies	224	101
Radio Programs	26	0
Value at \$4/hr	\$125,848	\$58,992
Value at \$7/hr	\$220,234	\$103,236
Regional Offices	3	1
Regional Coordinators	5	2.5
Total Staff Support	8	5

*Does not include 75,000 to 100,000 weekly listeners to radio series on 30 stations statewide, nor 62,000 homes receiving TV programs.

* * *

LAND MANAGEMENT

Land Acquisition and Exchange Section

The Bureau of Land's Acquisition and Exchange Section has two basic functions:

Land acquisition involves the procurement of land for state wildlife management areas, parks, forests, trails, fisheries, wild and scenic rivers, scientific and natural areas, water access sites, canoe and boating routes, water bank and other DNR purposes. This involves obtaining the rights to the land -- whether it is in fee title, easement, lease agreement, gift or other category.

To carry out land acquisition, the Section is responsible for obtaining appraisals; negotiating with landowners; handling relocation problems; obtaining surveys; and working with legal staff, private interest groups and local political subdivisions. This includes maintaining files on all land acquisition transactions, whether in process or completed, and preparing progress and other reports relative to the acquisition program.

During Fiscal Years 1981 and 1982, rights were acquired in 390 parcels of land totaling 23,118 acres, at a cost of \$11,703,642.86.

Land exchange involves working with all disciplines of the Department; plus regional administrators, counties, federal government, corporations and private individuals. About 70 exchange proposals are received per Biennium. These are reviewed to determine whether they are in the best interest of the state, and feasible as well as legally possible. Land exchange provides the only real means of adjusting state ownership patterns; consequently, exchange proposals are carefully reviewed. Proposals having merit are submitted to the Land Exchange Board, the final authority on all land exchanges.

During FY 81 and FY 82, a total of 39 land exchanges and one land transfer were completed involving 11,373 acres valued at \$2,514,412.

DNR Land Interests Acquired

July 1, 1980 through June 30, 1982

<u>Program</u>	<u>Parcels</u>	<u>Acres</u>	<u>Expenditures</u>
Canoe & Boating Routes	9	69.35	\$ 81,894.00
Fish Management Areas	96	693.10	840,852.10
Scientific & Natural Areas	11	1,132.60	271,344.50
State Forests	40	2,189.27	1,343,082.10
State Parks	36	6,099.98	3,304,254.70
Trails	25	1,126.99	775,949.63
Water Access Sites	44	70.14	1,198,331.00
Water Banks	32	1,163.34	362,110.49
Wild & Scenic Rivers	27	963.10	827,965.30
Wildlife Management Areas	<u>70</u>	<u>9,638.02</u>	<u>2,697,859.04</u>
Totals	390	23,118.89	\$11,703,642.86

Records, Leases and Sales Section

Records

The primary responsibility of the Records Unit is to provide ownership status and other pertinent data to all who request it, for each parcel of state-owned DNR-administered land. The records are kept in abstracts, maps, card files and a data processing system which covers all the foregoing lands, plus tax-forfeited land in all counties which administer significant acreage. The state ownership records contain 5,243,750 acres owned, and 3,488,000 acres which have been sold. Tax forfeited land totals approximately 2,799,187 acres which are in the process of being updated on the data processing file.

The DNR Field offices, regions and areas are provided annually with updated sets of microfiche listing every description of land which is either all or partly state-owned DNR-administered; and the tax-forfeited land which is state-owned, county-administered.

Lieu tax payments to the counties are calculated by the Unit. Payments for 1982 totaled \$4.3 million. FY 81 in lieu tax payment was made in FY 83 by amended legislation. Additional legislated payments are also calculated with \$721,530 having been certified for payment during FY 82.

State Land Leases, Licenses & Easements

The purpose of leasing, licensing and granting easements is to provide a means for the public to make use of State Lands for public, private, or commercial purposes when, by law or by policy, the DNR is restricted in the sale of the land.

DNR's Bureau of Land is charged with responsibility for the administration of surface leases, licenses and easements on state lands. (State land is defined as those lands which are under the control of the Commissioner of Natural Resources.)

State lands are used for various purposes, the most common being: utility rights-of-way, lakeshore and hunting cabin sites, agricultural purposes, gravel removal, and roadways. Before any lease, license, or easement is issued, future development of the land is considered by the administering division of the DNR.

As of June 30, 1982 the Bureau of Land was administering a total of 6,350 leases, licenses and easements. Revenue from state land for these uses amounted to \$782,575. Revenue increased 20 per cent from the previous Biennium. This increase is due to an expanded program, updating of fees to more realistic market values, collecting 50-year fees for utility crossings, and term fees for some leases and all easements.

State Land Sales

The purpose of the sale of state lands is to provide for disposal of such lands that are considered better suited for private development and are surplus to state needs for conservation purposes.

Land Sales in FY 82 totaled 1,543.00 acres. Total income from these land sales, plus previously existing land sale contracts, was \$208,154.

Condemnations on state-owned DNR-administered land brought in \$500,025 in FY 82.

Total income from disposition of land was \$708,179.

Public sentiment at the present time dictates a marked reduction in the sale of "state land." The Department has complied with the wishes of the public and drastically reduced the acreage of land being offered for sale. Neither the attitude of the public nor that of the Department is expected to change significantly.

Gross revenue for the sale, lease, license and granting of easements on state land through the Bureau of Land was \$1,490,754 for FY 82.

LAND EXCHANGES COMPLETED DURING FISCAL YEAR JULY 1, 1980 - JUNE 30, 1981

Exchange No.	Name	Class A,B,C	State Acres	State Value	County Acres	County Value	Private Acres	Private Value	Federal Acres	Federal Value	Date File Completed
B78	Al Ciernia & Cass Co.	B			43.57	\$ 9,043.20	40.00	\$ 8,634.60			091880
B80	Holland Industries & Aitkin	B			76.31	14,964.81	120.00	14,233.60			091980
B81	Cyril Walker & Koochiching	B			1.71	6,725.00	3.97	6,745.00			091980
364	Duluth, Messabi & Iron Range	A	100.00	\$17,525.00			133.24	17,525.00			100780
461	Kandiyohi County	B&C	10.00		10.00(legilative action)						101780
434	Mary Ann Smith, et al	A	14.60	4,300.00			21.20	5,300.00			103180
B82	Marcus Jackson & Koochiching	B			.16	650.00	.15	800.00			110780
405	Grant Bothum	A	1,000.00	180,000.00			998.89	180,000.00			121080
372	John Wolf	A	37.00	17,225.00			70.00	17,500.00			121180
412	David & Daniel Hiniker	A	8.32	21,242.00			8.58	21,225.00			121180
417	Headwaters Area Council BSA	A	80.00	12,250.00			80.00	12,300.00			121180
455	Minn. Historical Society	A	.553	(legislative action)			.565				020981
371	Arthur Gosse	A	80.00	33,000.00			100.00	33,060.00			031081
B83	US Forest Service & St. Louis	B			146.34	120,000.00			34.00	\$116,000	040581
B86	Ronald Stanchfield & Cass Co.	B			224.00	79,971.00	114.90	76,075.52			051381
443	Topeka Land Company	A	118.50	13,829.00			63.00	15,580.00			061181
B85	Robert Wolske & Cass Co.	B			40.00	8,893.52	40.00	9,042.66			061281
F21	U. S. Forest Service	S-Fed.	44.25	80,750.00					367.61	80.832	061881
418	Donald & Betty Davies	A	40.00	6,000.00			40.00	9,550.00			061881

LAND EXCHANGES COMPLETED DURING FISCAL YEAR JULY 1, 1980 - JUNE 30, 1981 (continued)

Class "A" Land

Total exchanges completed	10
Total acreage of state land exchanged	1,478.973
Total value of state land exchanged	\$305,371.00
Total acreage of private land exchanged	1,515.475
Total value of private land exchanged	\$312,040.00

Class "B" Land

Total exchanges completed	7
Total acreage of county land exchanged	532.09
Total value of county land exchanged	\$240,847.53
Total acreage of private land exchanged	319.02
Total value of private land exchanged	\$115,531.38
Total acreage of federal land exchanged	34
Total value of federal land exchanged	\$116,000.00

Class "A & C" Land Exchanges Completed 0

Class "C" Land

Total exchanges completed	1
Total acreage of state land exchanged	10
Total value of state land exchanged	N/A-Leg. Action
Total acreage of county land exchanged	10
Total value of county land exchanged	N/A-Leg. Action

State - Federal Land

Total exchanges completed	1
Total acreage of state land exchanged	44.25
Total value of state land exchanged	\$80,750.00
Total acreage of federal land exchanged	367.61
Total value of federal land exchanged	\$80,832.00

LAND EXCHANGES COMPLETED DURING FISCAL YEAR JULY 1, 1981 - June 30, 1982*

Exchange Number	Name	Class A,B,C	State		County		Private		Private		Date File Completed
			Acres	Value	Acres	Value	Acres	Value	Acres	Value	
359	Marvin Olson	A	20.00	\$20,890			37.50	\$20,905.00			070181
367	Lauren Wittowski	C	.06	\$900			.10	\$900.00			070181
427	Elmer Erickson et al	A	120.00	\$20,890			158.75	\$20,910.00			071381
451	Harlow E. Bergstrom	A	45.00	\$5,750			38.51	5,750.00			081881
381	Sidney Moorhead	C	160.00	\$29,000			80.60	\$29,000.00			101381
464	Ross McFadden	A	120.72	\$24,000			120.00	\$24,000.00			111981
471	Lowell Johnson	A&C	2.80	\$1,187			.18	\$1,200.00			121081
466	Bruce Purdie	A	0.33	\$710			0.37	\$712.50			122281
B87	Mark Danzl & Cass Co.	B			18.00	\$7,408.75	40.00	\$7,160.00			020582
B89	David Unthank & Crow Wing Co.	B			40.00	\$10,550.00	40.00	\$8,230.00			020582
B79	Blandin Paper Company	B			2,608.15	\$343,698.91	2,175.53	\$343,714.31			020582
F20	US Fish & Wildlife	C	122.00	\$9,600					160	\$9,600	031082
483	Henry Teiken	A	10.00	\$8,000			10.00	\$8,000.00			031782
484	Gerald M. Olsen	A	40.00	\$7,000			40.00	\$7,000.00			031982
490	Ken Polark	C	.65	\$36,700			.78	\$36,700.00			042682
435	Dale Howard	A	10.00	\$16,000			20.00	\$16,000.00			051482

LAND EXCHANGES COMPLETED DURING FISCAL YEAR JULY 1, 1981 - JUNE 30, 1982 (Cont.)

<u>Exchange Number</u>	<u>Name</u>	<u>Class A,B,C</u>	<u>State</u>		<u>County</u>		<u>Private</u>		<u>Acres</u>	<u>Value</u>	<u>Date File Completed</u>
			<u>Acres</u>	<u>Value</u>	<u>Acres</u>	<u>Value</u>	<u>Acres</u>	<u>Value</u>			
467	Allen Newman	C	0.10	\$2,000			0.40	\$2,000.00			060282
B90	USFS & Lake Co.	B			432.56	\$66,400.00			108	\$66,400	060482
B91	James Masloski &	B			40.00	\$10,112.25	38.45	\$6,061.50			060482
439	Dwain Beckel	C	4.00	\$6,000.00			120.00	\$6,000.00			062982

Class "A" Land

Total exchanges completed	8
Total acreage of state land exchanged	366.05
Total value of land exchanged	\$103,240.00
Total acreage of private land exchanged	425.13
Total value of private land exchanged	\$103,277.50

Class "C" Land

Total exchanges completed	5
Total acreage of state land exchanged	164.81
Total value of state land exchanged	\$74,600.00
Total acreage of private land exchanged	201.88
Total value of private land exchanged	\$74,600.00

Class "A & C" Land

Total exchanges completed	1
Total acreage of state land exchanged	2.80
Total value of land exchanged	\$1,187.00
Total acreage of private land exchanged	.18
Total value of private land exchanged	\$1,200.00

Class "B" Land

Total exchanges completed	5
Total acreage of county land exchanged	3,138.71
Total value of county land exchanged	\$438,169.91
Total acreage of private land exchanged	2,293.98
Total value of private land exchanged	\$365,165.81
Total acreage of federal land exchanged	108.00
Total value of federal land exchanged	\$66,400.00

State - Federal Land

Total exchanges completed	1
Total acreage of state land exchanged	122.00
Total value of state land exchanged	\$9,600.00
Total acreage of federal land exchanged	160.00
Total value of federal land exchanged	\$9,600.00

*Land Transfers on seperate report

LAND TRANSFERS COMPLETED DURING FISCAL YEAR JULY 1, 1981 - JUNE 30, 1982

<u>Transfer Number</u>	<u>Name</u>	<u>Class A,B,C</u>	<u>State</u>		<u>Governmental Subdivision</u>		<u>Date File Completed</u>
			<u>Acres</u>	<u>Value</u>	<u>Acres</u>	<u>Value</u>	
1L	Lake of the Woods Co.	A	38	\$8,000	40	\$8,000	071682

LEGAL

Legal matters of the DNR are handled by a Deputy Attorney General and assistants appointed by the State Attorney General. Among the services provided during the Biennium were the following:

- * Litigation in Federal Courts (including District Courts, Courts of Appeal, and the Supreme Court) and state District Courts and tribunals consisting of 236 cases, with 142 closed.
- * Acquisition of lands for the Department consisting of 107 tracts for the Division of Fisheries, 79 for wildlife management areas; 55 water access sites, 49 for Division of Forestry, 40 for State Parks, 39 for Trails and Waterways, 28 for Wild and Scenic Rivers, 33 for Water Bank Agreements, 13 Scientific and Natural Areas, and 10 Canoe and Boating routes.
- * Various legal services necessary for the preparation and accomplishment of 122 public hearings for the Commissioner of Natural Resources.
- * Collection of 89 delinquent timber accounts.
- * Disposition of 8 legislative claims.
- * Completion of 22 land exchanges with 40 pending.
- * Completion of 1 land title transfer with local governments, with 3 pending.
- * Approval as to form and execution of 6,436 documents including various contracts, permits, deeds, leases, licenses and federal aid documents.
- * Preparation of 182 Commissioner's Orders.
- * Preparation of 11 formal Attorney General's Opinions; and numerous written advisory opinions to the various agencies and offices served by the staff.

In addition to these specific, quantifiable legal services, the Legal Bureau staff has provided services to the Department in connection with the drafting of 45 legislative bills for introduction in the 1981 and 1982 Legislative Sessions; the drafting and adoption of rules relating to boat and water safety, water surface use and water appropriation; appearances before legislative commissions and committees; preparation

of pamphlets containing the laws administered by DNR (such as the handbook of Game and Fish laws); the drafting of Commissioner's delegation orders; and assistance in the drafting, amending, and administering of the several hundred mineral leases currently in effect.

The staff also provided legal services to the State Soil and Water Conservation Commission, the Land Exchange Board, the State Executive Council and many state agencies dealing with Indian matters.

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ENGINEERING

The Bureau of Engineering is a multi-discipline design team composed of architects, engineers, land surveyors, landscape architects and technicians which is responsible for providing professional design and construction services for the development and operation of DNR administrative, recreational and natural resource facilities. The Bureau provides surveying and mapping services required to locate land; prepares topographic maps needed for design activities; and graphic services for the layout and production of displays, recreational and resource maps; informational signs and interpretive displays.

During the Biennium, the Bureau had more than 400 development projects under construction, with a total value in excess of \$9.5 million. These involved providing detailed design, preparation of construction documents, and construction contract administration for each project.

The Bureau also completed 190 boundary surveys, and provided professional advice and technical assistance on a continuous basis to the Department.

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

- * The complete development of Afton State Park including roads, bridges, three major buildings, water and wastewater systems, trail development, prairie restoration and landscaping, etc.
- * The design and construction of an additional 50 acres of seed beds for the Badoura Tree Nursery, including a complete well and irrigation system.
- * The design and construction of a new water intake system for the French River Hatchery which can draw 850 gpm from Lake Superior.
- * The complete reconstruction of the wastewater collection and treatment system at Itasca State Park to meet Minnesota Pollution Control Agency (MPCA) standards.
- * The complete design and construction of Round Lake Water Access including roads, parking lot, concrete ramps, curbing, dock, fencing and total landscaping.
- * The complete technical drafting, graphics and printing of recreational user handout maps for parks, forests, rivers and trails for use by the public.

The Bureau of Engineering is continuing to improve its professional services to the Department; and thus to citizens of the state.

* * *

FINANCIAL MANAGEMENT

The Bureau of Financial Management provides basic accounting and budgeting services in direct support of all natural resource programs administered by the Department. These services include establishing and maintaining the chart of accounts in the State-wide Accounting System (SWA)--i.e., appropriation accounts (APID's) and allotment accounts (AID's); 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 functions for consultant services, professional and technical services, and purchased services; properly recording and depositing receipts; preparing receipt forecasts; providing standard reports generated from and distributed by SWA on a monthly basis; 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 and supplemental financial information; preparing financial statements for the Game and Fish Fund; and monitoring annual spending plan allocations and expenditures to maintain integrity of the accounting system and to avoid possible overexpenditures.

In addition, specialized accounting and budgeting services are provided for accounts or funds that are established statutorily and require specific distribution of receipts on an annual basis. These include:

1. Consolidated Conservation Areas Fund (M.S. 84A.5)
 - Receipts from consolidated conservation areas are deposited in this fund and a sum equal to 50% is paid to the counties wherein lands are located; the remaining 50% stays in the fund and is currently used to help fund the Forestry General Operations and Management Activity.
2. Mining Rents and Royalties
 - a. Tax Forfeited Properties (M.S. 93.355, Subdivision 4) - If the lands or minerals and mineral rights covered by permit or lease are held by the state in trust for the taxing districts, the rentals and royalties paid under such permit or lease are distributed annually as follows: 20% to the state General Fund and 80% to the respective counties in which lands lie, to be apportioned among the taxing districts interested therein as follows: county, three-ninths; town or city, two-ninths; and school district, four-ninths.

- b. State Trust Fund Lands (M.S. 16A.125) - All receipts from royalties on, or the sale or lease of, any minerals from any state school lands or other public lands subject to trust provisions under the state constitution are deposited to the state trust funds concerned in accordance with their respective interests in the minerals from which the receipts were derived.
3. State Forest Fund (M.S. 89.036) - Receipts from state forests are deposited in this fund and a sum equal to 50% of the gross receipts is paid to the counties wherein lands are located; the balance is transferred to the Forest Management Fund.
4. Leech Lake Special License Account (M.S. 97.433) - An amount equal to 5% of the proceeds from the sale of all licenses sold for hunting, fishing, trapping, or taking minnows is remitted to the Leech Lake Band. The money to make the quarterly payments is appropriated in a ratio of 60% from the Game and Fish Fund and 40% from the General Fund.
5. Payment in Lieu of Taxes (M.S. 97.49, Subdivision 3, Game and Fish Fund) - A sum equal to 35% of the gross receipts from all special use permits and leases of lands acquired for public hunting grounds and game refuges, or 50 cents per acre on purchased land actually used for public hunting grounds and game refuges, or three quarters of 1% of the appraised value of purchased land actually used for public hunting grounds and game refuges, whichever amount is greater, is paid annually to the county in which said lands are located.
6. State Forest Suspense Account (M.S. 16A.125) - All receipts from the sale of timber or other revenue from state forest trust fund lands are deposited into the State Forest Suspense Account, specifying the trust funds interested in such lands and the receipts therefrom, respectively. The distribution of receipts credited to this account is as follows: (1) the total costs incurred by the state for the purposes of managing forest trust fund lands is transferred to a special operating account known as the State Forest Development Account, and (2) the balance of said receipts is transferred to the Forest Management Fund and may be appropriated to implement the state forest resource management policy and plan only on state forest trust fund lands.

The Bureau of Financial Management also 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 policies and procedures.

Accomplishments and Performance Indicators:

	<u>FY 81</u>	<u>FY 82</u>
Appropriation Control - APID's	168	162
Allotment Control - AID's	1,093	877
Invoices Processed	29,700	27,400
Approved Complement	1,635	1,672
Budget/Expenditures (General Operations and Management)	\$78,759,600	\$79,058,700
Receipts Processed	\$42,677,500	\$44,031,100
Federal Indirect Cost Rate (percent)	34.1	25.8
Report Distribution	8	8

In addition, several major accomplishments and improvements have occurred in the area of financial management during the Biennium:

The creation of an internal Revenue Accounting Task Force to study current revenue accounting procedures and systems in the Department. The Bureau of Financial Management worked with members of the task force and provided input in evaluating the current revenue accounting system; determining current deficiencies, problems, and unmet needs; and recommendations for a new revenue accounting system for implementation.

The development and implementation of a Department-wide plan to achieve the mandatory expenditure reductions authorized for FY 81 and FY 82 General Fund appropriations. Pursuant to Executive Order 81-2, the Department cancelled \$3,291,000 in FY 81. The total impact of the expenditure reduction plan authorized by the legislature for FY 82 amounted to approximately \$5,710,000.

The promulgation of internal financial management policy and procedures to improve fiscal awareness and accountability throughout the Department.

* * *

PERSONNEL

The Bureau of Personnel was very active during the past Biennium in providing the Department's operating units and their employees with necessary administrative service for the direction, advice and professional guidance in personnel management, labor relations, employee training and payroll. The Bureau has continued to strive toward increasing its level of performance through staff training and development, along with establishing meaningful standards of performance that motivate its employees to achieve greater levels of accomplishment.

During this period 1,145 classifications were reviewed by Bureau staff members. Included in this number were major classification studies of the Department's regional hydrologists, Division business managers, Central Office Trails and Waterways staff positions, Regional Trails and Waterways supervisors and a department-wide clerical study. A study of the Department's Division of Parks and Recreation positions is in its initial stage of implementation and tentatively scheduled for completion during late spring of 1983.

A constant effort toward improvement in its role in the examining process is a commitment of the Bureau. In line with this is a trend toward more objective promotional rating criteria and the development of item banks for entry level examinations. During this period the Department was represented at numerous career fairs, new recruitment literature was prepared, and a tentative examination announcement plan was developed for entry level and advance level professional and supervisory examinations. Thirteen "class specific" promotional examinations were developed and implemented.

The Bureau facilitated the Department's participation in unit clarification hearings conducted by the Bureau of Mediation Services, that resulted in appropriate unit designation for 86 Department employees. Bureau personnel represented the Department on state negotiating committees in negotiating contracts with exclusive representatives for employees in eight bargaining units. Contract administration training was conducted for all Department supervisors and managers for these negotiated agreements.

Forty-two grievances, presented by exclusive representatives of employees covered by various agreements, were settled at various stages of contractual grievance procedures. The Bureau continually provided overall direction to Department managers/ supervisors in administering negotiated labor agreements and interpreting contract language, as well as guiding and counseling them in addressing disciplinary matters and in the handling of grievances.

Improvements in the preparation and processing of the payroll for approximately 1,750 full-time and up to 1,300 seasonal, part-time and temporary employees was a major objective of the Bureau during the Biennium. The decentralization of the preparation of the payroll for field employees to the Department's six regions was completed, and the direct mailing of payroll warrants to employees' home addresses was implemented. The net effect of these changes was an improved Department payroll system, more responsive to the complexities associated with paying a geographically dispersed workforce consisting of a wide variety of terms and conditions of employment. Department policies and procedures were developed to facilitate the implementation of the changes in the Department's payroll system while insuring consistency with statewide policies mandated by the Departments of Finance and Personnel.

In conjunction with the processing of the payroll, the Bureau prepared and/or processed approximately 18,000 personnel/payroll transactions affecting the status of Department employees. These transactions were monitored regularly and periodic audits of the regional payroll functions were begun, to ensure compliance with policies and procedures.

The Bureau's training function continued to formulate Department-wide training and development plans and policies, assess training needs; and prepare, conduct and evaluate training programs. Specifically, managerial/supervisory training needs were assessed. This has resulted in plans for a more systematic approach to managerial and supervisory training. All training conducted within the Department was reviewed and approved by the training unit. Direction was provided for Division training boards, particularly in preparing training and development plans, along with curricula specific to the needs of their area of specialization. The training staff provided job development and career counseling to Department employees in a continuing effort toward maintaining a well-trained workforce.

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LICENSE BUREAU

The DNR License Bureau provides the general public with the statutorily mandated licenses and registrations which enable individuals to engage in hunting, fishing, boat and snowmobile activities; or to derive an income from our natural resources via commercial fishing, operating shooting preserves, etc. This is achieved by developing, distributing and accounting for all licenses, registrations and revenue received from their sale.

Licenses and registrations are sold at the DNR License Center in St. Paul and at some 4,000 vendors (county auditors, deputy registrars, sporting goods stores, bait shops) for ready accessibility to the public. Watercraft and snowmobile registrations are also available through the mail.

In addition, the physical portions of all DNR lotteries were handled by the License Bureau, including the turkey (7,223 applicants in 1982), bear (9,627), doe (223,900), and the moose lottery (20,521 in 1981).

Sale of hunting, fishing and watercraft licenses and registrations continued at a high level during the Biennium. A total of more than 593,400 watercraft registrations were maintained. This ranked second in the nation behind Michigan. This is the highest per capita registration in the nation; one registered watercraft for every 6.87 people in the state. Although record snowfall was experienced during the Biennium, snowmobile registrations dropped slightly, with current registrations about 220,000. Minnesota, nevertheless, ranked second in the nation (again behind Michigan) in snowmobiles registered.

All game and fish license fees were increased effective March 1, 1982 which should result in an increase in revenue of approximately \$6 million. Twenty-eight different types of regular hunting and fishing, and 41 types of commercial licenses were issued by the Bureau. Minnesota ranks sixth in the nation in the sale of both hunting and fishing licenses. In revenue produced, Minnesota ranks fourth in the nation in fishing licenses and seventh in hunting licenses.

Additional significant accomplishments during the Biennium included:

- * Changing the snowmobile registrations from a monthly to a fiscal year renewal. This enabled the Bureau to process registrations upon receipt and to deposit funds immediately, rather than the several weeks hold as in the past. Also, the workload is now more evenly distributed, eliminating the necessity of hiring additional emergency help.

- * Initiation of a new method of issuing canoe decals. In previous years about one-half of the pre-numbered decals were destroyed because individuals did not renew their licenses. The Bureau now employs blank decals with the year and number on self-adhesive tabs. Any decals remaining will be used in four years -- the rotation of colors.
- * Computerizing the alphabetic, numeric and license-type lists of commercial licenses.
- * Replaced the procedure of issuing temporary 60-day permits for snowmobiles and boats and replaced it with a tissue copy attached to the application, which is cheaper and will serve as a temporary permit and receipt. The issuing agent now is required to complete one form, instead of two.
- * Established the framework for the registrations of antique snowmobiles and the issuance of the Fifty Year Golden License.
- * Simplified the certification of marine toilets by revising one form and eliminating another, speeding up processing of watercraft registrations.

* * *

FIELD SERVICES

The Bureau of Field Services provides for all Department personnel in the areas of equipment and supply purchase; equipment fabrication, maintenance, repair and disposal; building maintenance and repair; coordination of new buildings, and building disposal; acquisition of Federal Excess and Surplus Property; coordination of the Safety Program; and Fixed Asset Inventory Control.

Field Services provides expertise and purchased products for some 1,700 personnel, located statewide. The activity places priority on providing professional assistance in the numerous areas of service, in order to minimize the amount of time resource managers spend on support.

Activity Objectives:

- * Develop specifications, process requisitions, arrange disbursement and process for payment, materials, equipment and supplies for the Department.
- * Maintain and repair a variety of miscellaneous equipment on a continuing basis.
- * Standardize specifications and "downsize" vehicles to the extent possible.
- * Maintain limited equipment pools at each DNR Region and Service Center, for multiple staff use.
- * Upgrade equipment by routing replacement of first action and emergency type units down through the organization, thereby disposing of poorest.
- * Maintain statewide forest fire caches at the Service centers.
- * Acquire federal excess and state surplus property for eligible programs. Dispose of Department surplus property on a continuing basis, including consumable items. Conduct three DNR auction sales annually to dispose of surplus and obsolete items.
- * Provide service in the areas of building construction, repair and disposal. Reduce number of buildings.
- * Coordinate the Department safety program through the Department's Regional and Central Office safety committees.
- * Improve and maintain fixed asset and consumable inventory control.

Field Services accomplishments during the Biennium included:

Developed specifications and processed 1,500 requisitions FY 81; 1,800 FY 82.

"Downsized" 25 vehicles in FY 81 in the interest of energy conservation; 27 in FY 82.

Maintained equipment pools at Regions and Service Centers, for multiple staff use. These consisted of 103 items in FY 81; 98 in FY 82.

Upgraded 35 pieces self-propelled equipment in FY 81 by relocating within the Department; 43 in FY 82.

Maintained statewide forest fire caches at two locations; consisted of 1,800 items in FY 81; 1,820 in FY 82.

Conducted two auction sales in FY 81 to dispose of used and surplus materials and equipment; three in FY 82.

Reduced gross square footage of DNR buildings by 67,702 feet for the Biennium. Consolidated four DNR office facilities.

Disposed of 133 buildings acquired incidental to the purchase of land in FY 81; 40 in FY 82.

Other significant accomplishments during the Biennium:

- * Completed a Department-wide physical inventory on fixed asset property.
- * Improved accuracy and control on fixed asset inventory.
- * Initiated and completed special inventory projects on consumable items.
- * 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 firearms.
- * Acquired Federal Excess property for eligible programs, including rural fire program.
- * Evaluated and improved coordination of the Department's surplus property program.
- * Completed installation of new short-wave radio equipment for Forestry.
- * Maintained six regional safety committees.

* * *

MANAGEMENT INFORMATION SYSTEMS

In the past, systems development was best described as one of "fall-back and regroup". The accelerating demand for data processing, word processing and communications capabilities, coupled with the decreasing costs of related hardware, had spawned a head-long dash into the distributed processing world on a project-by-project basis. Little or no thought was given to overall planning and compatibility problems which might occur.

To prevent evolution into an information nightmare, DNR management directed an internal task force to develop an overall Departmental approach for information needs.

The end result of this continuing study will be a long-term plan, encompassing hardware and software data processing acquisition and development; shared logic word processing capabilities, with distributed input stations; and a cost effective communications network, which will handle electronic mailing and filing problems.

Based on a preliminary review, the Legislative Committee on Minnesota Resources (LCMR) has tentatively approved a \$600,000 grant to activate the plan, starting with the 1982-1984 Biennium.

* * *

RECORDS and OFFICE SERVICES

While providing information assistance to the public and essential support services to the many units of DNR, the Bureau of Records and Office Services has intensified the Forms Management and the Records Management activities.

The majority of all new and revised DNR forms were designed and prepared "copy-camera-ready" for printing, thus reducing printing costs to DNR units during the Biennium.

Twenty-seven units within DNR have inventoried all their records. Retention schedules were then prepared establishing disposition dates for the records, which will be followed until such time as the retention schedules need to be updates.

* * *

OFFICE of YOUTH PROGRAMS

The Office of Youth Programs operates the Minnesota Conservation Corps (MCC) Program, comprising a year-round and a summer program.

The year-round program employs young adults (age 16 to 25) for up to six months, at the federal minimum wage. They do conservation-related work in state and local parks, forests, wildlife areas, or on other public land. This program provides public agency a year-round work force to complete natural and recreational resource projects, while providing unemployed young adults an opportunity for meaningful work in the natural resources area.

The summer program employs 15 to 18 year-old youths eight weeks during the summer, at the federal minimum wage. The youth work for 35 hours, and receive five hours of environmental awareness training a week. The youth are eligible to receive high school credit for the hands-on educational component. This program provides an additional work force during the summer, when the demand on natural and recreational resources is the greatest, and when thousands of youth are out of school seeking summer jobs.

* * *

COMMUNITY LIAISON

During the Biennium, the Department's Community Liaison offices maintained a close working relationship with the Red Lake Reservation; the four Sioux Communities of Prairie Island, Shakopee-Chaska, lower Sioux (Morton) and upper Sioux (Granite Falls), and the Minnesota Chippewa Tribe member reservations: Bois Forte (Nett Lake), Fond du Lac, Grand Portage, Leech Lake, Mille Lacs, and White Earth.

The agreement between DNR and the Leech Lake Reservation remains in effect and continues to be successful in resource management and regulation.

The legislation allowing DNR to enter into an agreement with the White Earth Reservation has not been implemented, but work continues in that direction.

The 1981 Legislature mandated a report by the DNR to the 1983 Legislature to review and analyze the relationship between the DNR and the Mille Lacs Band of Chippewa Indians, with input from all interested parties. This report is presently being compiled.

The DNR Wildlife Division and the Leech Lake Reservation have a highly successful cooperative waterfowl refuge located on the Reservation, and the two parties are working toward the creation of similar refuges.

The equipment loan program to the Reservations has concluded. Surplus equipment necessary to maintain resource regulatory efforts was sold to the Leech Lake Reservation.

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