

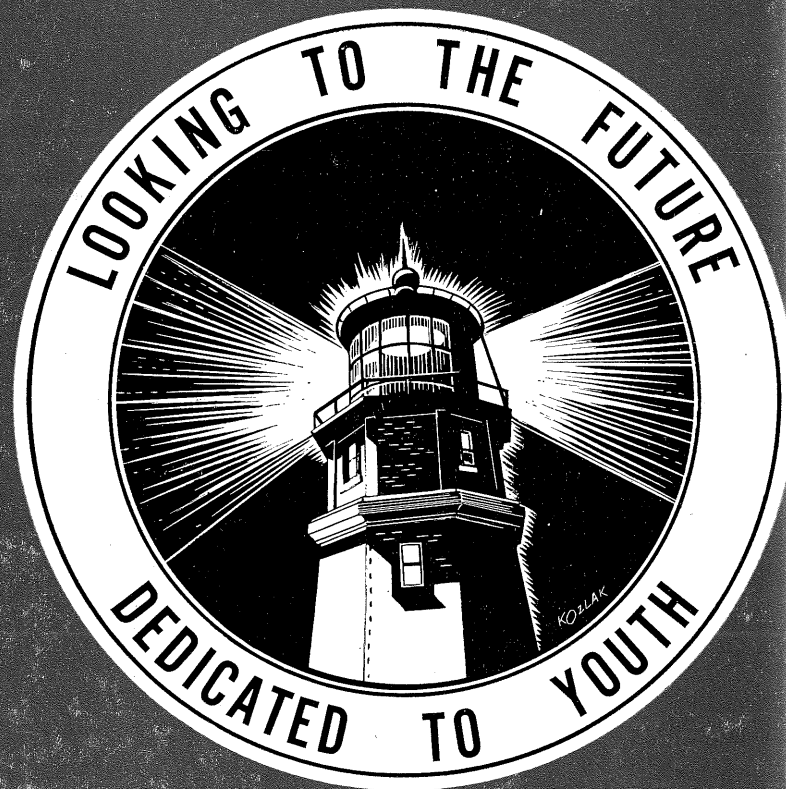


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*Biennial
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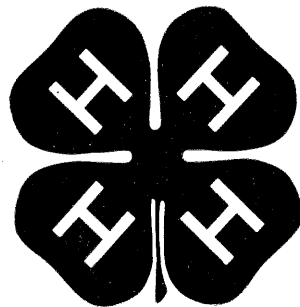
MINNESOTA DEPARTMENT OF CONSERVATION



*To the Governor and the Legislature
of the State of Minnesota:*

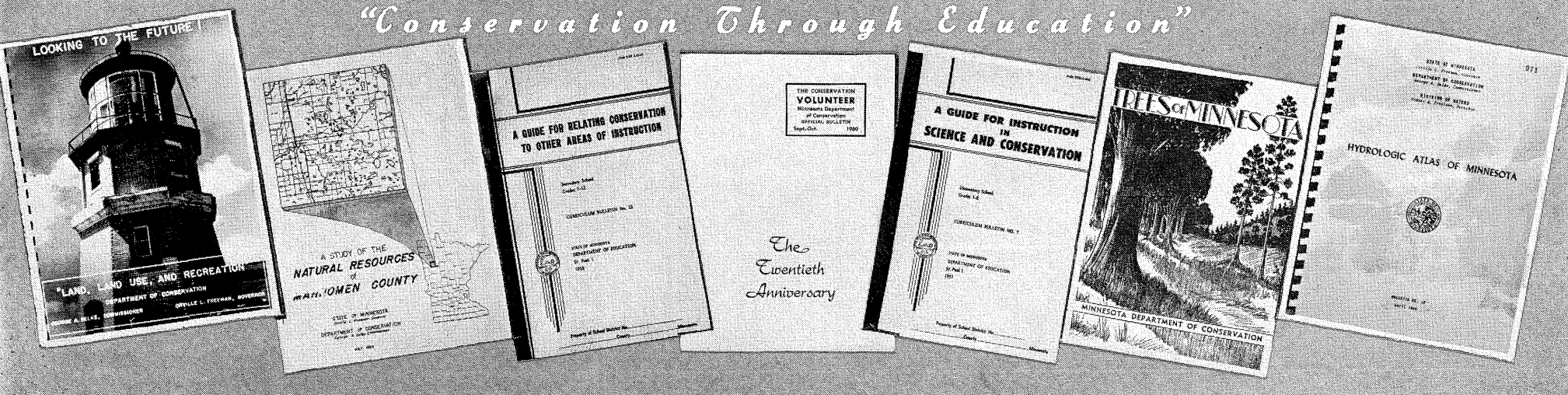


*This biennial report is a story of
our heritage, a record of our steward-
ship, and a prospectus for the future.
It is dedicated to our Youth.*



*George A. Selke
Commissioner of Conservation*





Resources for the Future

Conservation is generally defined as "wise use" of our natural resources. The early concept of "to preserve," and the more popular "hunting and fishing" approach have been discarded. Today any definition of conservation that does not provide for the present and future use of resources to promote a sustaining economy is unacceptable.

Conservation is best defined as a philosophy or way of life; it is a rule and guide for resource management; it teaches the interdependency of all things; it recognizes the aesthetic in Nature and the spiritual in man; and it is manifested in a rewarding economy for today and tomorrow.

Although conservation is generally accepted today, it is not always understood. Everyone has a stake in conservation. The farmer and the productivity of his farm; the community and the health of its citizens; industry and the raw materials for continued operation; and the school boy and his future welfare. Resources are the support of all existence and all resources have their multiple use.

We are no longer a pioneer society. The proper use of resources has become a necessity. Living room for a growing population, industry and wildlife is an ever-increasing problem. In this world of automation, atomic power and space travel, outdoor recreation assumes new meaning, with added significance to such elementary joys as a breath of fresh air, the sight and sounds of birds, and the beauty of our wild flowers. Today we need a united approach to the conservation of natural resources in order to preserve the American way of life for this generation and the next.

Conservation Fundamentals

In formulating any program of conservation there are certain basic aims,

objectives or principles that may be considered guide posts to resource management.

1. **Administration** — Administration of the Department of Conservation is comparable to the management of a large corporation. It determines policy and program. It is concerned with accounting, personnel management, license sales, legal services, engineering, and management of the physical plant. Administration is both stewardship and good housekeeping of natural resources.

2. **Education** — Public support through education is the key to progress in conservation. It is through understanding that the conservation program will win the support of people and the legislature. Only when the necessity of conservation is accepted as whole-heartedly as the need for public education will progress keep pace with the resource demands of today's world.

3. **Finance** — Expenditures of the Department of Conservation including the Division of Game and Fish are limited by legislative appropriation. Game and Fish funds (receipts from hunting and fishing licenses) finance the operation of the division, but also are subject to legislative transfers such as appropriations for conservation administration, water pollution, and other allocations including bounty payments. These and other transfers through the years have constituted a substantial drain upon the operating reserve of the division.

Monies spent for conservation are investment, not expenditure. It is far better to provide adequately for conservation than to total up the cost for the lack of it or to stand idly by and watch the parade of ghost projects that might have been.

4. **Forestry** — Forests, a multiple resource, are essential to wildlife, recreation and industry. Multiple use does not imply numerous equal uses of a single area, but rather a planned primary use accompanied by compatible secondary uses.

5. **Land Acquisition** — Areas for conservation purposes are increasingly difficult to acquire. For this reason we have placed priority on land acquisition for public access, wildlife management, and state park purposes.

6. **Minerals** — Iron ore is our most important non-renewable resource. Perpetuation of iron mining as an industry has been realized through research enabling the utilization of taconite and low grade ores. Research has also made Peat the newest member of our resource family. Other minerals require exploration.

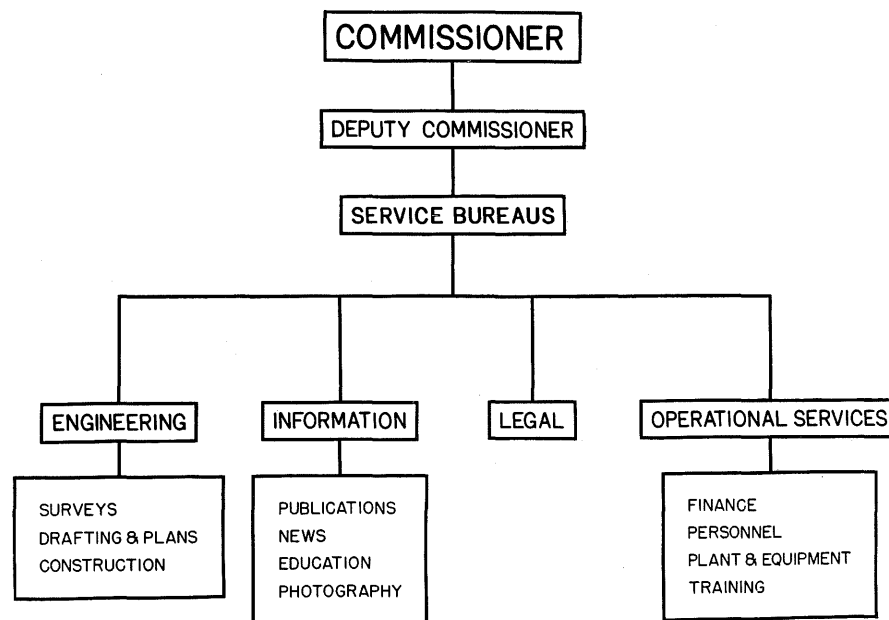
7. **Outdoor Safety** — Human values in conservation are too often overlooked. Outdoor safety is an obligation and duty.

8. **Personnel** — Successful operation of a good conservation program requires personnel that are trained, experienced and dedicated. Every regular employee of the department should know that as long as work is faithfully done he will have tenure of position; that every employee should receive adequate compensation so that he and his family can live in accordance with an acceptable standard of living; and that every employee should also have the assurance that when his years of service are completed he will have the protection afforded by an adequate retirement.

9. **Recreation** — State Parks must keep pace with increased population, mobility, income, and leisure time.

10. **Research** — Research provides the factual basis for scientific management.

FUTURE FARMERS OF AMERICA — National president Jim Thomas, of Tennessee, and Minnesota Conservation Department commissioner George A. Selke.



11. **Soil and Water** — Soil and water are the twin supports of all existence.

12. **Wildlife** — The growth and popularity of hunting and fishing has created new demands upon our wildlife resources. Scientific game and fish management is a necessity.

Mahnomen County Study

On the local level the Mahnomen County study recently completed by the Department of Conservation is a pilot plant inventory and analysis of the basic natural resources such as soil, water, forests and wildlife. In addition the study covers such other matters as population, transportation, agricultural development, county finances, land ownership, parks, and public and private recreational facilities. Out of this investigation — one of only a few of its kind ever made in the United States — comes a comprehensive collection of facts which can be used as the basis for a program of planned land use and resource management.

The Watershed Approach

Water conservation begins in the watershed. Water in flood stage is at times terrifying and destructive, but if traced back to the point of origin is but a gentle rain or trickling rivulet. If water is to be controlled for the benefit of man, soil and water conservation must start in the upper reaches of the watershed.

In conservation the greatest advance in resource planning of a generation is the watershed program. It is described in a publication of the Department

ment of Conservation titled "Hydrologic Atlas of Minnesota." It is presented in the form of 39 watershed or major river valley systems which show land and water areas, soil and water statistics, rate of flow in streams, climatic data, records of water levels, and sources of water supplies for the communities in the watershed.

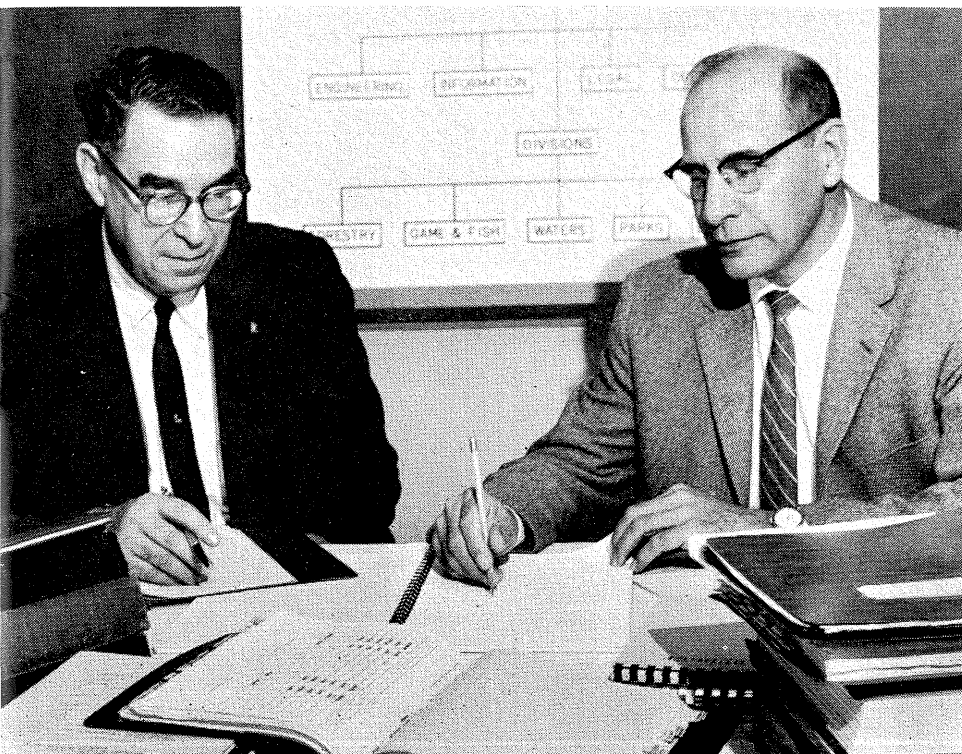
The Watershed program is an integral part of the planning and programming of the Department of Conservation and in mobilizing all state departments and federal agencies, all industry, and all political subdivisions in a unified approach to our conservation program. For practical operation these problems are sometimes best approached through a combination of counties, soil conservation districts, or watershed areas.

Achievement Report

Sometimes to look ahead it is reassuring to look back. Achievements of the past five years are a record of progress:

1. Conservation Emergency Works Program was authorized in June 1958 by special session of the Minnesota Legislature. It was advance planning in anticipation of such a program by the Department of Conservation that insured the success of the \$1,500,000 program.
2. A milestone in Conservation Education was achieved in the publication of Curriculum Bulletin No. 23, "A Guide For Relating Conservation to Other Areas of Instruction." It received national award.

ADMINISTRATION — Deputy Conservation Commissioner Clarence Prout, left, and Howard B. Munson, director of the bureau of operational services, review the budget.



CONSERVATION CAREERS — National Resource Conservation is a field which attracts many career-minded individuals. John W. Jackson, left, commissioner of Civil Service, and Robert J. Brown, Conservation personnel officer, monitor a Civil Service examination for candidates. For information on career opportunities with the Minnesota Department of Conservation write: Department of Civil Service, State Office Building, St. Paul 1, Minnesota.

3. The recommendations of the 21-member Minnesota Boat and Water Safety Committee contributed in large measure to the enactment of the Minnesota Boating Act of 1959. Incidentally, the top award of the Minnesota Safety Council for the state department contributing most to safety in any calendar year has been awarded to the Department of Conservation three out of the last five years.
4. The establishment of the Bureau of Engineering Services was finally achieved in November, 1958. Improved services to our building program and in land acquisition are already evident.
5. The activation of the Boating Law of 1959 rates as an outstanding administrative achievement. Boat licenses were available in the hands of the County Auditors by June 1 of that year.
6. During the five-year period ending December 31, 1959, fifty state-owned mining units were active in producing 41 million tons of royalty ore and taconite. Revenue totaled \$22 million.
7. The Game and Fish Division has completed an economic survey of the value of sport fishing and hunting in Minnesota. Approximately \$145 million is spent annually by sportsmen in pursuit of this recreation. Nearly 50 million sport fish weighing 25 million pounds are harvested annually in Minnesota.

8. Approximately 620 useable public access sites have been acquired to-date. As of June 1, 1960, a total of 76,634 acres of wetlands have been purchased, or optioned for purchase, in 70 state counties.

9. Forest products represent a \$200 million annual business in Minnesota. State nursery distribution of tree planting amounts to nearly 27 million trees, more than double the 1955 production. More than half of the annual production goes to private woodlot owners.

10. Use of our state parks by tourists and campers has increased at a phenomenal rate since 1955. Visitations (just under 3 million in 1959) are up 50%, while camper days are almost 600% higher than five years ago.

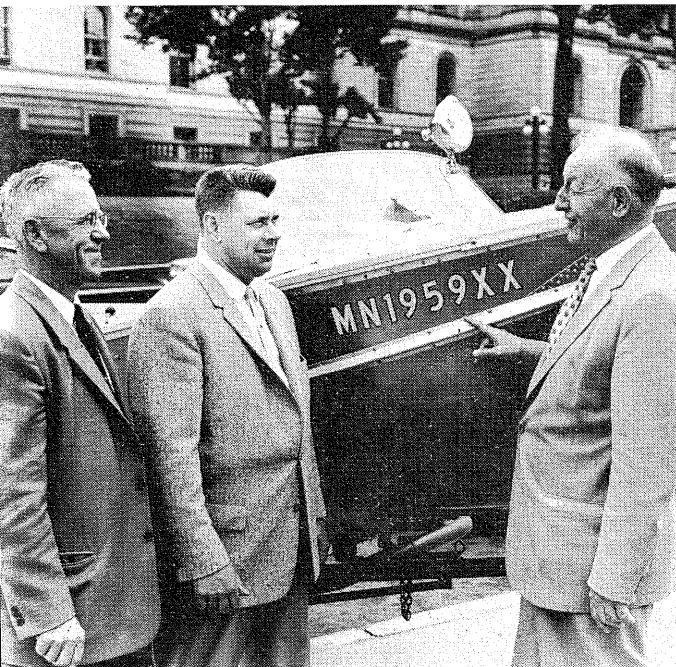
Engineering — The Bureau of Engineering was established on November 5, 1958. It is charged with the responsibility and sufficiency for property and project surveys, design and construction supervision relating to dams, bridges, roads, buildings, fish rearing ponds, sanitation, electrical, heating and water supply facilities, channel improvements, wildlife refuge areas and other projects that may be sponsored by the various divisions of the Department. The bureau is also delegated to prepare maps, plats, cost estimates, specifications, material lists, engineering reports and to assemble engineering data as required in connection with the above or to supply those data to determine whether the contemplated development is feasible from the engineering aspects.

The scope of work and problems for which the services of the bureau has been requested has greatly broadened during the past biennium. The added impetus given to the recognition and development of recreational facilities has resulted in a large increase in the number of requests for engineering services. The waste of funds on ill-conceived projects can only be prevented by previously collecting all the basic data which constitutes the only sound foundation for such projects.

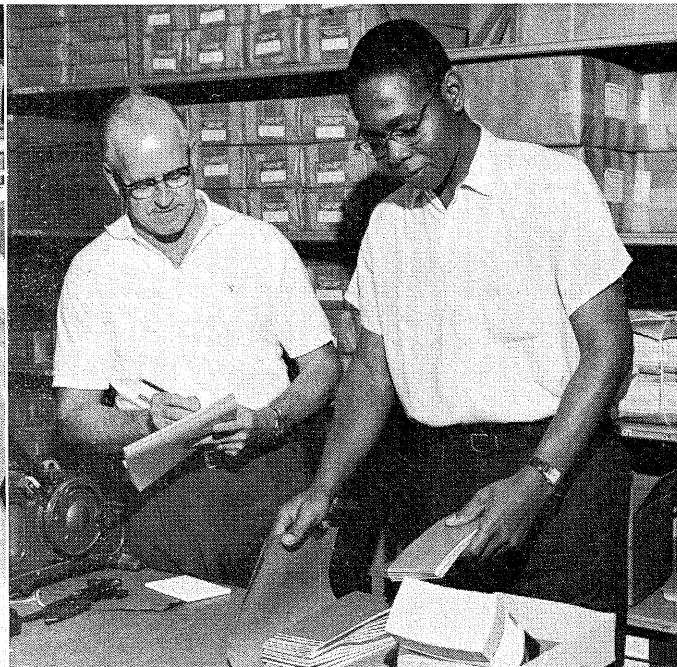
Information — Conservation has enjoyed greater public acceptance in the past biennium than any comparable period in the history of the Department of Conservation. The Bureau of Information, since its inception twenty-one years ago, has directed its efforts to the consummation of a program of "Conservation Through Education."

The bureau consists of a director and a staff of ten clerical and technically-trained employees. The popularity of The Conservation Volunteer has attracted national attention with a circulation of 36,000. The weekly newsletter distributed to over 500 newspapers is easily our best dollar investment. Natural resource education has advanced in the integration of conservation materials into the school curriculum. "Following Conservation Trails" in cooperation with the University of Minnesota's School of the Air has added materially to the more than 125 sound-tape programs now available to schools. Nearly 300,000 pieces of literature were mailed during the second year of the biennium to fill requests received by this office. Other activities

BOAT REGISTRATION



LICENSES



ENGINEERING



include the film loan library, the tree planting program in cooperation with the Federation of Women's Clubs, a program of outdoor safety through the Minnesota Safety Council, and a service of "Reports and Report Making" on background materials in conservation.

Legal — As a party to binding agreements and in cases involving conflicting claims, the Conservation Department is similar to any individual or legal entity. The Department takes part in many transactions which call for legal services of a highly technical nature. Legal counsel is required in such matters as acquiring property, entering into contracts, negotiating claims, participating in hearings and handling litigations in courts of law. Responsibilities of the legal staff include providing counsel on matters which arise through various Conservation Department procedures and the handling of all legal proceedings in which the Department is involved. Personnel of the legal bureau are paid and furnished office space by the Department, although members are under the supervision of the State Attorney General's office.

Operations — The Bureau of Operational Services, created in 1954, is a staff bureau of the Commissioner's office. It provides administrative services to the operating divisions and is responsible for the development of good business management practices throughout the department. The bureau is organized into three sections; namely, Finance, which is responsible for the operation of the department accounting system and budget control; Personnel, which is responsible for the preparation of all payrolls, personnel records and personnel transactions and policies; and Plant and Equipment, which is responsible for maintaining a system of inspection and operating costs of

all motorized equipment in the department, game and fish license sales and accounting, department office supplies, and mail and messenger service systems.

Some of the achievements of the bureau during the past biennium are as follows: The Bureau of Operational Services was assigned responsibility for the administration of the Conservation Works Projects law which appropriated \$1,500,000 to the Conservation Department for conservation projects in the distressed employment areas and coordinated the work between the divisions. During the peak of the program, approximately 1,500 persons were employed in this program.

In cooperation with the Highway Department, a state-wide sign program was inaugurated. Large metal signs were posted on trunk highways directing the public to all conservation stations and headquarters. In addition, lake access signs were posted directing the public to roads leading to many of our lakes and streams.

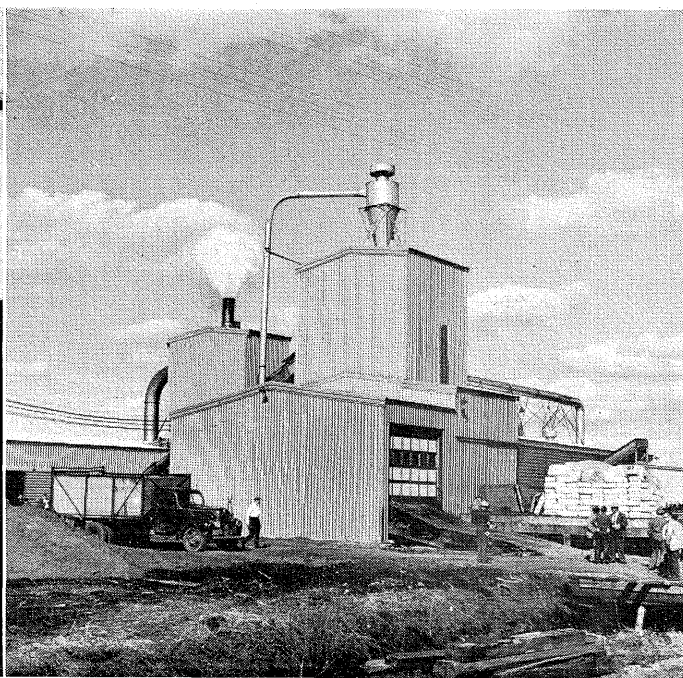
During the biennium, state employees have become eligible for social security and unemployment compensation. Each of these programs requires individual reports on each employee who files for benefits.

On April 26, 1959, the legislature passed the boat and water safety law which provided that all boats be licensed by July 1, 1959. During May and June an all-out effort was made to develop a program, devise and print licenses and all other matters relating to the administration of this law.

TELEVISION



FIRST PEAT PLANT



FLYING PHOTOGRAPHER



Forestry

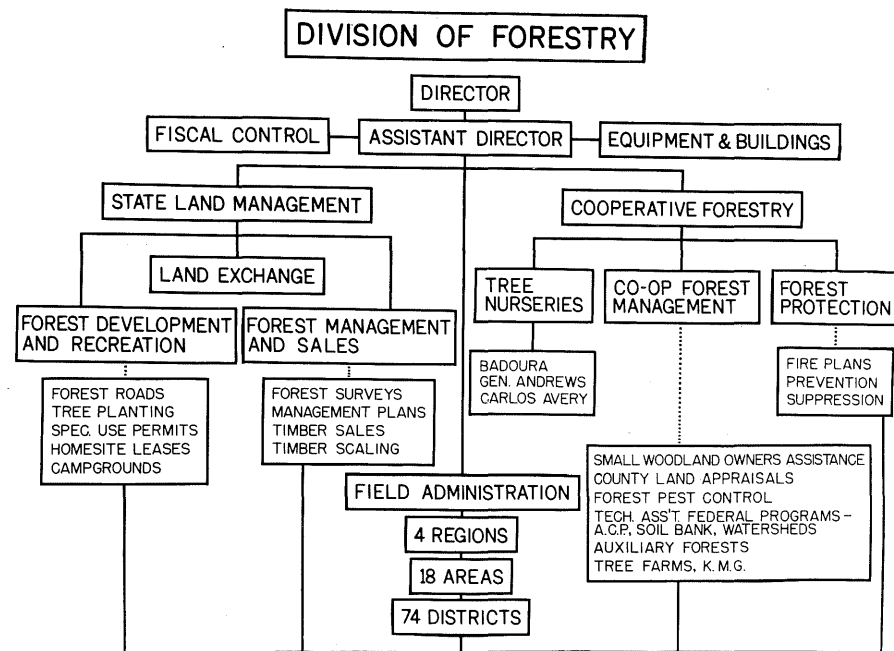
E. L. LAWSON, Director

The forests of Minnesota today are recognized as one of the state's greatest assets, not only in yield of wood products, but in other significant conservation values. Our 34 established state forests are managed under multiple use principles which involve many considerations other than growing trees for wood products. These principles involve trees, soil, water, wildlife and recreational values which are all elements in a management pattern to serve the people. Multiple use does not imply numerous equal uses of a single area, but rather a planned primary use accompanied by compatible secondary uses.

State forest lands are used for many purposes, and special use permits cover a wide variety of activities. These uses include timber harvest, farming, and the leasing of lakeshore sites for summer homes and resorts; hunting cabin sites; tourist camping opportunities; road, railroad, power transmission, pole, and pipeline rights-of-way; and many other commercial and non-commercial uses.

The Division of Forestry, in cooperation with the other divisions of the Department of Conservation, has, during the past two years, completed a forest use study of all state lands administered by this department. This study resulted in the dedication of additional lands to state forest use. On October 27, 1959, by Commissioner's Order, 830,000 acres of state land were added

LEARNING BY DOING—Children throughout the state school system learn a valuable conservation lesson through participation in the annual Minnesota Federation of Women's Clubs Arbor Day program. Mrs. L. F. Johnson of Willmar is conservation chairman for the state federation.



to those lands already in state forest. There now are 3,070,000 acres of state owned land dedicated to state forest use.

The long range land exchange program now under way will serve to consolidate state holdings within the established boundaries of our state forests. Almost 42,000 acres of federally owned lands, have been exchanged with the state for state lands of comparable value in the past six years. Similarly, exchange programs of private and state lands have added 7,500 acres to state forests. Exchange proposals presently under way and now pending involve approximately 18,200 acres of state land for approximately 14,000 acres of federal land and 4,600 acres of private land.

The state forest pattern is now established for the northern portion of the state. In Southeastern Minnesota, a new state forest of great significance will also be developed on the multiple use principle. This forest is known as the Minnesota Memorial Hardwood Forest and will ultimately embrace 200,000 acres within seven counties, encompassing the wooded bluffs bordering the Mississippi River and tributaries between the Twin Cities and Iowa. Although this forest is still in the early planning stages it will undoubtedly provide outstanding public recreation along the Mississippi, as well as furnish a steady supply of forest products.

The productivity and the quality of the public forests and forest lands owned by major forest industries will improve as a result of present relatively good management practices and policies. The real key to the future timber supply lies in most of the eight million acres of farm and other small private forest holdings in Minnesota, which are largely non-productive because of

lack of good forestry practices, grazing by livestock and destructive cutting. Forestry assistance programs now being carried on with small woodland owners should be expanded so that a more aggressive promotion of good forestry practices can be accomplished on such woodlands.

Steady gains are being made in fire prevention and control. However, the job will become increasingly difficult with an expanded forested area, increased timber harvest, and accelerated recreational usage. Looking broadly into the future a strong fire organization must be continued and supported financially to provide adequate protection equal to the increased needs.

We can expect an increasing and continuing trend of coordination of land management programs by all Conservation agencies, public and private.

Tremendously expanded requirements by the public for recreational facilities are going to necessitate the development of more state owned lake-shore properties for public use, and more campgrounds within state forests. More forest roads and trails will be needed to make timber and game accessible for harvest and to provide quick access for fire control.

There is a big job ahead to reforest lands in need of planting so that such lands can again become productive within a reasonable time. The advance so far has been slow in view of the need to get deforested areas into production and to keep them producing. Plantings in the past have obviously been largely confined to the more favorable sites such as old abandoned fields, large forest openings and light, open brush areas. The job ahead will be more difficult. Future planting areas will necessitate considerable site preparation through herbicide spraying and other measures to kill off or reduce heavy brush cover or scrub and offsite species which now occupy the ground. Tree planting on state owned lands will be accelerated. There will be an upward trend in planting on both public and private lands, both in forest and shelterbelt plantation.

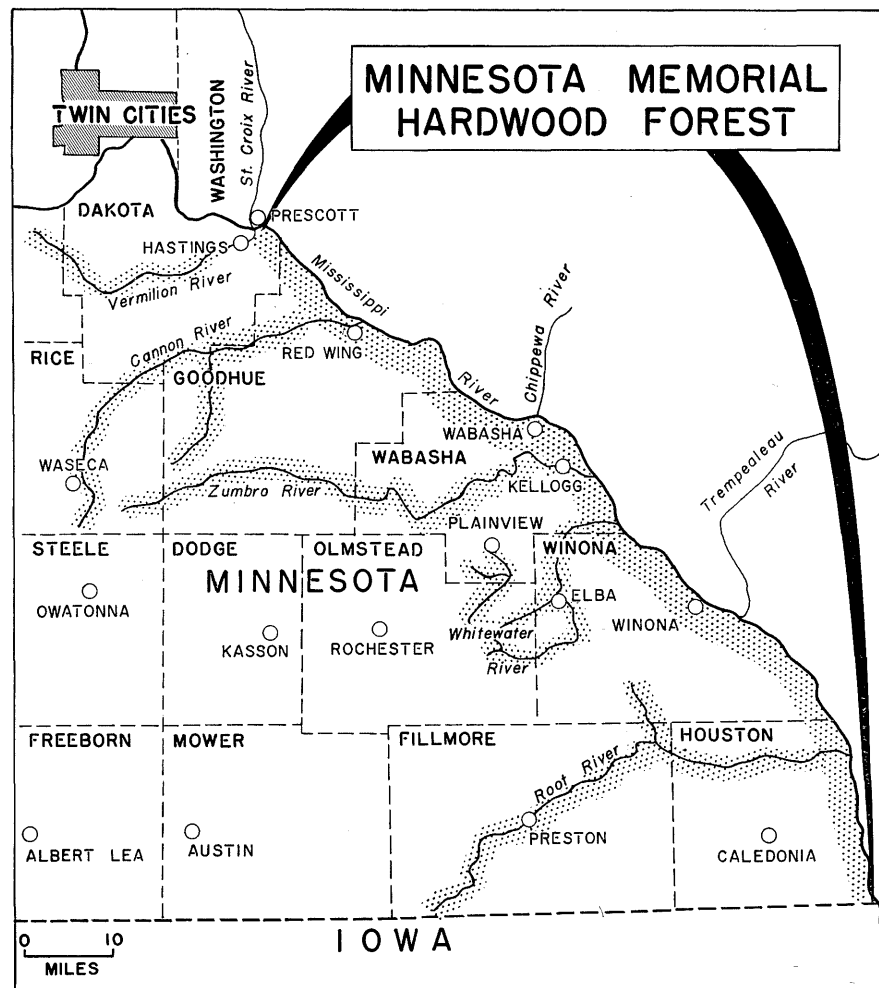
State nurseries must expand their production to keep pace with the increasing private and public demands for tree planting stock. The immediate goal is for 50 million trees annually. This goal may need to be increased in the future.

State Land Management

The state land management section is responsible for the intensive management of more than three million acres of state land within state forests and management of the timber resources on an additional area of nearly two million acres not in state forest status. Management responsibility within state forests includes timber sales administration, homesite and other leases, campgrounds and forest development.

Emphasis is placed on long range management planning which includes the planning of land exchanges between the state and other public or private agencies and adjustment of state forest boundaries to consolidate ownership for more efficient management.

Close contact is maintained with other land management and research agencies in order to evaluate new techniques, equipment and research results for possible application on state lands.



A NEW STATE FOREST — Of great recreational and economic potential is promised with the establishment of the Minnesota Memorial Hardwood Forest in the famed Hiawatha Valley. Conceived by the Minnesota Izaak Walton League, and implemented through its capable state president, Richard Dorer, in cooperation with the Department of Conservation, the great forest encompasses the valley and major tributary streams from St. Paul to the Iowa border. It is designed to serve a two-fold purpose: (1) Recreation — To insure preservation of the vast recreation potential of the valley through watershed protection and development, erosion control. (2) Economic — Forest products returns through hardwood timber harvest on equal share basis with cooperating counties.

Timber Sales

The fiscal year 1959 was one of somewhat depressed markets for pulpwood and other forest products but a 21 per cent increase in volume harvested was noted during the fiscal year 1960.

Research agencies have predicted substantial increases in demand for forest products in the future. However, present markets have not absorbed the total production capacity of state lands.

A total of 304 auction timber permits were issued during the biennium in more inaccessible forest areas.

Forest Development

During the biennium, the Division of Forestry planted nearly 12 million trees on 8,500 acres of state land. The total expense for planting nearly 12 million trees during the past two years was \$244,000 or about \$21.00 per thousand trees.

Each year more acreage requires preparatory treatment for planting because the planting sites remaining contain brush or heavy grass. Approximately 1,500 acres were aerial sprayed during the biennium for brush control to release young trees.

State Forests

In the past years the Minnesota Legislature has established by legislative act thirty-four state forests. Within the established forest boundaries the state land totals 2,240,000 acres. On October 28, 1959, George A. Selke, Commissioner, Department of Conservation, by his order, added 830,000 acres of state-owned land as addition to the existing state forests, making a total of 3,070,000 acres of state forest land. Legislation has been prepared

MINNESOTA'S 1,000th TREE FARMER — Harold K. Anderson, 33, Brainerd businessman and Cass county farmer, posts his Tree Farm sign as his wife, Doris, and three daughters — Christine, 7, Carla, 3, and Katherine, 1, look on with approval. Anderson manages a 23 acre Tree Farm 9 miles northwest of Brainerd.



FIGHTING FIRES — Via aerial assault, a converted Navy torpedo bomber (TBM) jettisons a load of fire retardant chemicals during the course of a "test run" in the Grand Rapids area. Trials of this modern-day fire fighting procedure have proved so promising the Department of Conservation has slated more intensive testing of the technique.—Cut courtesy Grand Rapids Review.

for presentation to the 1961 legislature which would revise the present state forests.

Campgrounds and Cabin Sites

Within the state forest boundaries the Division of Forestry has for years provided primitive campgrounds. At the present time, there are 26 such campgrounds accommodating from 5 camping units at the smaller, to 30 at the larger. This is entirely inadequate for the people wishing to use such campgrounds, particularly during weekends. It is estimated that by 1975 the state must provide an additional 100 such campgrounds of 30 units each. This will require a considerable expenditure both for the establishment and maintenance of these recreational areas. The annual appropriation for this work must be increased substantially.

Land Exchange

In 1939, the Legislature enacted laws (Chapter 94, Minnesota Statutes Annotated) which provide for the exchange of state-owned lands for federal and privately owned lands with the unanimous approval of the Land Exchange Commission.

Land exchange is an important program in that it effects a consolidation of state-owned lands in state forests and other conservation areas and relocates private owners of isolated lands.

Plans for the exchange of state and federal lands in the Superior National Forest, Chippewa National Forest and remaining blocks of public domain lands in northwestern Minnesota are nearing completion. In the meantime a number of state and federal exchanges have been completed.

The Lake States Forest Experiment Station completed new laboratory facilities in Grand Rapids in early 1960. The Division of Forestry is closely allied with this forest research agency on a number of projects ranging from silvicultural management research on a number of timber types to regeneration problems including chemical herbicide experiments, equipment development and planting methods.

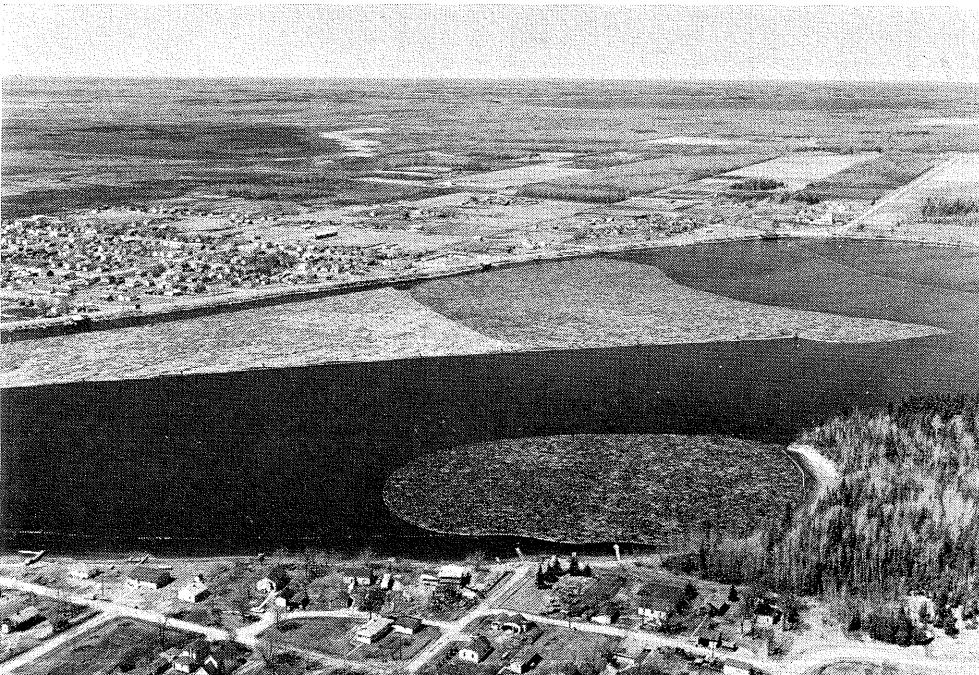
Forest Protection

Currently a principal activity of the Division of Forestry is to provide fire protection to nearly 18 million acres of forest, brush and grasslands. In addition protection will be extended to Goodhue, Wabasha, Olmsted and Houston counties. New equipment including the airplane for detection and suppression, improved radio communication and a substantial addition to our present system of roads and trails will increase the effectiveness of fire control. Although fire control is a major operation in our program of forest protection, forest pest control receives constant attention and is recognized in the program as of equal stature.

Cooperative Forest Management

Cooperative Forest Management is concerned with the owners of limited timberland acreages and their harvesting and marketing problems. One

PAPER HARVEST — Great rafts of pulp wood logs for the paper mill on Rainy river at International Falls. In the background, Fort Francis, Ontario.



TREE FARM BENEFITS



of the outstanding problems in Minnesota forestry is the management of small woodlands, comprising over a third of the commercial forest land in the state and 86.4% of the private commercial forest land.

The 1947 Legislature passed a law MSA 88.79 which provided that foresters could be employed to furnish owners of less than 1,000 acres of

forest land, forest management services consisting of advice in management and protection of timber, selection and marking of timber to be cut, measurement of products, aid in marketing and such other services as necessary or advisable to promote maximum sustained yield of timber.

State Nurseries

The Division of Forestry operates three nurseries to produce tree planting stock for state, county, school, and other public lands, and for sale to private land owners for windbreak, shelterbelt and conservation plantations.

Present problems now faced by the nurseries are the direct result of a greatly accelerated production program. In the last 10-year period, production has risen from 3,115,732 trees shipped in 1950 to a 27-million tree shipment in the spring of 1960. This is a nine-fold increase.

According to present inventories next year's shipments are expected to range in the neighborhood of 39 to 40 million or more, and the year after that in excess of 40 million trees.

Youth Conservation Commission Forestry Camps

The first camp to be established is located at the General C. C. Andrews State Nursery at Willow River; the second YCC camp, authorized by the Legislature of 1955, was set up at Thistledeew Lake, 33 miles north of Nashauk; and the third YCC camp, authorized by the Legislature of 1957, was established in the St. Croix State Forest, east of Sandstone in Pine County. Wards at these camps are employed in timber stand improvement, picking pine cones, tree planting, camp construction, road construction and associated forestry activities.

ESTIMATED VALUE OF FOREST PRODUCTS HARVESTED IN MINNESOTA 1959

PRODUCT	AMOUNT HARVESTED IN MINNESOTA	PULPWOOD SHIPPED			VALUE OF PRODUCTS PROCESSED OR USED IN STATE			TOTAL VALUE
		OUT OF STATE		MINN. MILLS				
		CORDS	VALUE	CORDS	CORDS	UNIT VALUE	TOTAL VALUE	
1 PULPWOOD	994,465 Cords	273,025	5,733,525	721,440	991,790	162.39	161,058,987	166,792,512
2 LUMBER	275,000,000 Bd. Ft.					92.50	25,437,500	25,437,500
3 FUELWOOD	625,000 Cords					15.00	9,375,000	9,375,000
4 CHRISTMAS TREES WREATHS ETC.	6,300,000 Pieces					1.15	7,245,000	7,245,000
5 POSTS	8,715,000 Pieces					.35	3,050,250	3,050,250
6 MATCHWOOD COOPERAGE ETC.	41,000 Cords					49.90	2,045,900	2,045,900
7 SHAVINGS, SAWDUST NOVELTIES, STAKES, ETC.	630,000 Tons					2.50	1,575,000	1,575,000
8 CHEMICAL BY-PRODUCTS	253,200 Tons					4.03	1,020,575	1,020,575
9 POLES	185,500 Pieces					4.75	881,125	881,125
10 VENEER WOOD	6,000,000 Bd. Ft.					90.00	540,000	540,000
11 MILL REFUSE USED AS FUEL	190,000 Tons					2.50	475,000	475,000
12 RAILROAD TIES	210,000 Pieces					2.15	451,500	451,500
13 MINING TIMBER	5,000,000 Bd. Ft.					60.00	300,000	300,000
14 PILING	225,570 Lin. Ft.					.70	157,899	157,899

TOTAL . . . \$219,347,261

—Cut courtesy Forest Industries Information Committee.

Game and Fish JAMES W. KIMBALL, Director

Minnesota is rated as one of the nation's outstanding states for fishing, hunting and out-of-doors fun. Many of the state's industries can attract top-flight people to work here because of the many outdoor attractions to be found in the Gopher State.

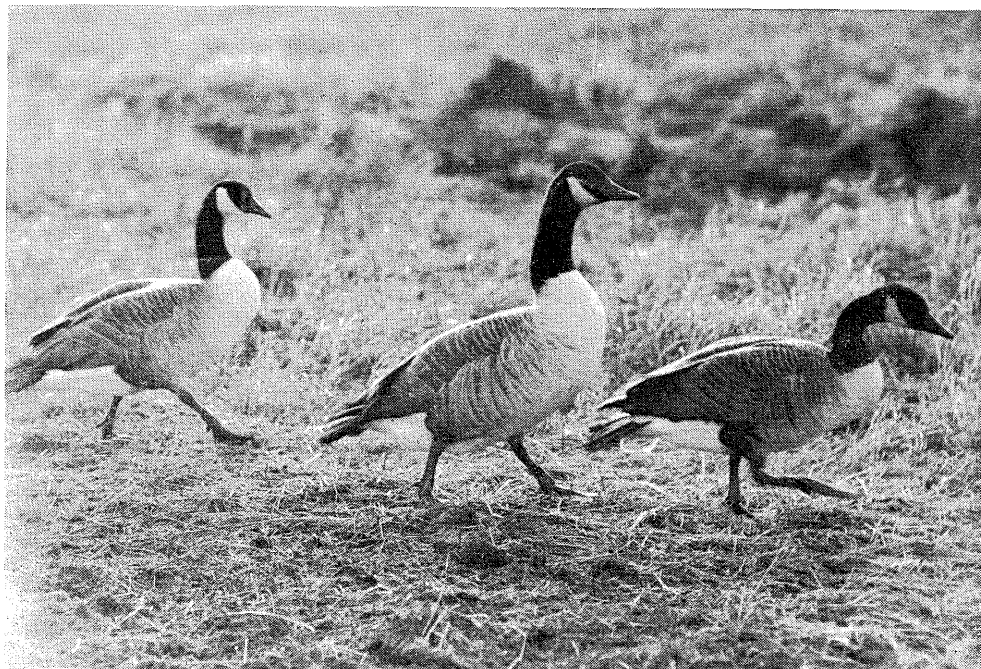
Hunting and fishing are furnishing over 60 million hours of outdoor enjoyment a year. Fishing is probably the main attraction for Minnesota's 300 million dollar a year tourist business. Hunters and fishermen spend 145 million dollars annually in Minnesota.

Free public access is urgently needed to an estimated 5,000 lakes. There is need for a "crash" program on public access supported by a broader financial base.

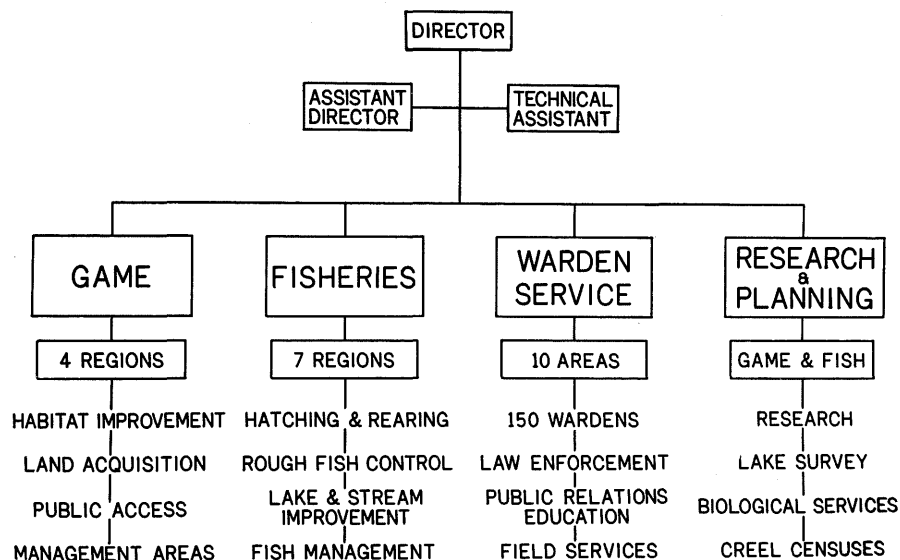
Natural northern pike spawning grounds are fast disappearing as lake-shore development increases. Needed in the next 20 years are 500 of these spawning sites.

Seventy-eight thousand acres of prime wetlands have been saved from drainage in 70 counties under the "Save Minnesota's Wetlands" program. Wetland areas are not only valuable for ducks, upland game and furbearers, but also provide public hunting grounds and also conserve surface water. Some 175,000 additional acres of wildlife wetlands need to be acquired in the next 10 years lest it be lost to drainage.

CANADIAN MARCH — Canada geese step smartly in a Minnesota Wildlife Management area — and what hunter wouldn't thrill to have one of these magnificent birds lined up in his gun sights on a crisp autumn day?



DIVISION OF GAME AND FISH



Currently, the Division maintains about 2 million acres of refuges and public hunting grounds. These areas are being developed to provide hunting for more people. The Division has built miles of hunter access roads into previously inaccessible country, built numerous small water impoundments and improved many acres of wildlife habitat.

Wildlife management work necessitates cooperation with forest and agricultural agencies. There are now 385 wildlife management units in 76 different counties. It is estimated that an additional 325,000 acres of wildlife land and public access sites will have to be acquired by the year 1975.

Law Enforcement

The Section of Warden Service is the law enforcement arm of the Division of Game and Fish. The objective of the section is to enforce all laws and regulations pertaining to wildlife with the thought in mind of preventing violations as efficiently as possible, apprehending and prosecuting those who have no regard for the objectives of wildlife management and working toward gaining the wholehearted approval and cooperation of the citizenry of the state in general.

The Warden Service is authorized to have a complement of 151 men and three clerk-stenographers. We have a chief warden and two assistant chief wardens at the St. Paul office. One of the assistant chief wardens is in charge of the Firearm Safety program and one of the clerk-stenographers is assigned to his office. The state is divided into ten warden supervisory districts, with each area having from twelve to fifteen men.

A game warden is expected to perform a great variety of duties all pertaining to conservation. Among the major activities are:



GUN SAFETY ON PARADE — Warden Francis Teske of the Winona area employed a parade to promote Winona's Youth Firearms Safety Training program. On the float with Warden Teske are members of his training class. Eager youths reach for copies of the "Ten Commandments of Hunting Safety." A practical demonstration of "Youth Conservation," the program through 1959 provided training for over 72,000 boys and girls in the 12 to 16 year age category, and certification for 17,347 youths. Of some 3,500 volunteer instructors teaching classes, 477 were newly trained last year. According to Jerome P. Liemandt, assistant director of Firearms Safety, this state wide instruction has resulted in a 19 per cent decline in hunting accidents, attributable to youths 16 years and younger, since the program's inception in 1956.

Game and fish law enforcement; posting game refuges; making game and fish surveys; checking on wild animal damage complaints, such as deer, beaver, bear, pheasants, squirrels, raccoon, muskrat; checking commercial fishermen; predator control; blowing beaver dams; water pollution investigation; looking for lost persons; checking hunters, fishermen, trappers; issuing bounty certificates; attending court trials; scaling beaver pelts; checking fur buyers and minnow dealers; attending sportsmen's clubs; Division of Waters violations; wild rice law enforcement; and firearm safety program.

Our warden force is completely equipped with two-way mobile radios for the automobiles and in addition we have several of the new style transistor equipped walkie-talkies. We cooperate with the state highway patrol and have reported to them and at their request held serious violators for the patrol. The highway patrol has also given us valuable assistance. As our radios are on the same frequency as the state highway patrol, it makes it very easy for these two services to cooperate with each other.

Before the highway patrol obtained their own airplanes, we spent considerable time in assisting them in traffic control with our three planes. We have, however, flown 37 hours of traffic control for them during the past two years. Our planes are equipped with 15 watt two-way radios and in addi-

tion to the help we give the highway patrol are invaluable in law enforcement work, wildlife census and in looking for lost persons. The flying time during the past biennium totals 2,319 hours.

Arrests for this biennium (1958-60) totaled 8,213. For comparison the 1956-58 biennium totaled 7,830. Fines levied against game and fish violators amounted to \$195,819.07.

Confiscations for this biennium (1958-60) were 5,082. For comparison in the 1956-58 period the confiscations totaled 3,636. Confiscations ranged from game and fish through fishing equipment, firearms, fur pelts, wild rice, fish nets, and included twelve automobiles.

Fish Management

The Section of Fisheries has the responsibility of carrying out a statewide fish management program, in accordance with law, department policies, and available funds. The objective is to provide a maximum, sustained yield of fish from the waters of the state and the maximum number of satisfactory sport fishing hours.

Fish management activities include habitat improvement; acquisition, development, and management of natural spawning areas; operation of hatcheries and rearing ponds for the propagation and distribution of fish; rescue of fish from lakes where they are subject to winterkill; rough fish control; lake reclamation through the use of fish toxicants; administration of licensed commercial fishing; formulation of regulations governing the harvest of fish; and acquisition of public access to lakes.

Lake improvement projects during the biennium totaled 40 and included the construction of six water-control dams, three carp-control dams, five carp-control screens, nine fish barriers on reclaimed trout lakes, 15 northern pike spawning areas, one walleyed pike spawning area, three spawning areas on reclaimed trout lakes, two carp trapping areas, and eight channel improvement jobs. Seventeen trout streams were improved and maintenance was carried on on many streams. In addition to the above, two public accesses were also constructed.

Natural spawning area acquisition totaled 578.13 acres, adjacent to ten lakes.

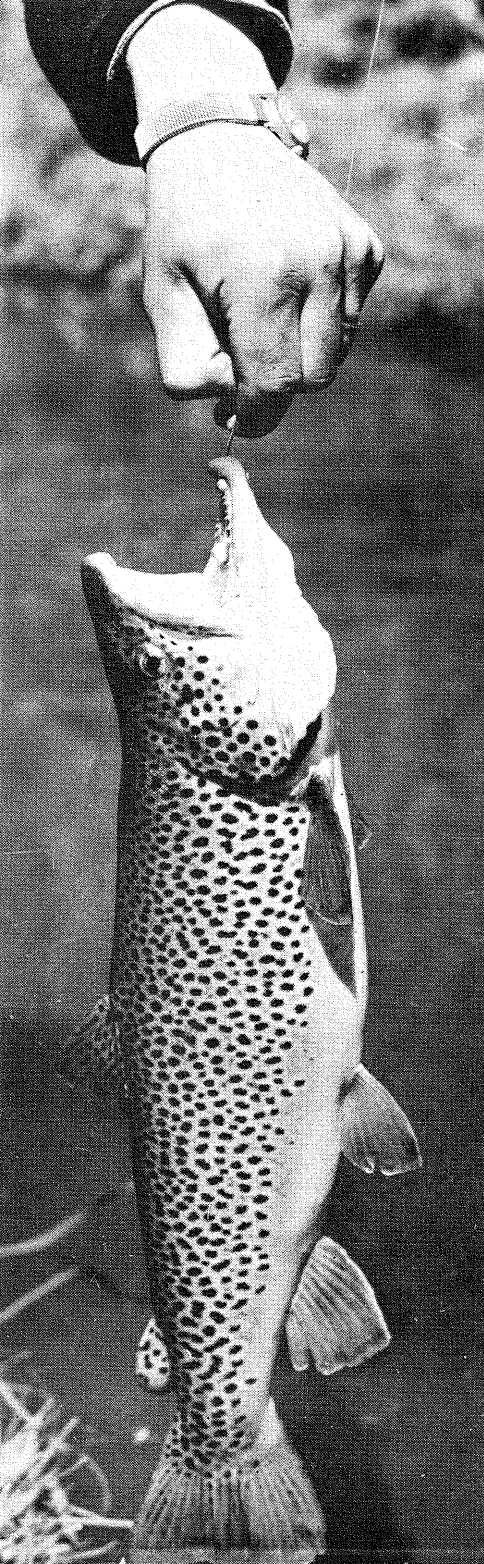
Thirty-three lake reclamation projects, with a total area of 4,314.36 acres, were carried out during 1958 and 1959. Up to and including 1959, 60 lakes have been reclaimed—50 for stream trout, two for grayling, one for lake trout, and seven for northern pike, bass, and panfish.

The management of natural northern pike spawning areas, tributary or adjacent to lakes, is very important for the maintenance of this species. This involves the installation of water-control structures and channel improvement, and in many cases fish transfer. During 1958, 50 such areas were managed; in 1959, 57.

Fish rescue operations on lakes subject to winterkill are becoming increasingly important in fish management, particularly for northern pike. Some wild rice and waterfowl lakes are actually managed for northern pike production by checking and controlling the number of adult fish that migrate into them during the spring spawning runs and removing them with the young-of-the-year by special trapping techniques during late fall and winter.

PUBLIC ACCESS — MORE PLACES TO HUNT AND FISH





Production of game fish from such areas in 1958 totaled 473,271 fish, weighing 137,274 pounds, of which 117,986 were northern pike, weighing approximately 90,000 pounds; in 1959, 638,187 fish, weighing 179,067 pounds, of which 193,147 were northern pike, weighing approximately 136,000 pounds.

Rough fish removal operations by state crews, contract, permits, and bullhead project resulted in the removal of 22,468,423 pounds of rough fish during the biennium. A considerable portion of this amount was low-value fish, which were sold for animal food.

The responsibility for acquisition of public access sites was transferred from the Section of Game to the Section of Fisheries during the last-half of the biennium. A complete inventory on the status of public accesses to lakes by various agencies has been made and a manual on land acquisition was prepared for use by field personnel.

Much remains to be done in the management of the fishery resources of the state. With the knowledge and techniques now available, the production of fish from our lakes to the sport fishery could be increased by more intensive management of each body of water. This would, of course, mean an expansion of most of the activities, fish management tools so to speak, referred to in this report.

Game Management

The Section of Game is charged with the responsibility of administering the state's wildlife resources, most of which are managed primarily for recreational purposes. This obligates the Section to plan, develop, and promote a comprehensive game management and development program throughout the state.

The Regional and Area Game Management organization of the Section of Game continued to function smoothly and local problems were most expeditiously handled by field men. Numerous meetings were attended and many news releases were made by Section personnel. "Show-me" trips were conducted on Thief Lake, Hubbel Pond, Roseau River, wetland units and forest-game wildlife management projects.

Again in this biennium as in preceding bienniums the most important activity of the Section of Game has been the acquisition of wetlands under the "Save Minnesota Wetlands" program. This program has been vigorously carried out to the extent of available funds by our game managers. Progress of the wetlands acquisition program is shown in the following table:

Progress of the Wetlands Acquisition Program

Dates	No. Counties	No. of Units	No. of Options	No. of Acres Optioned & Acquired	Cost
1958-1960	10*	126	346	26,294.61	\$ 900,949.63
Prior to 1958	60	259	436	50,962.19	1,480,249.75
	70	385	782	77,256.80	\$2,381,199.38

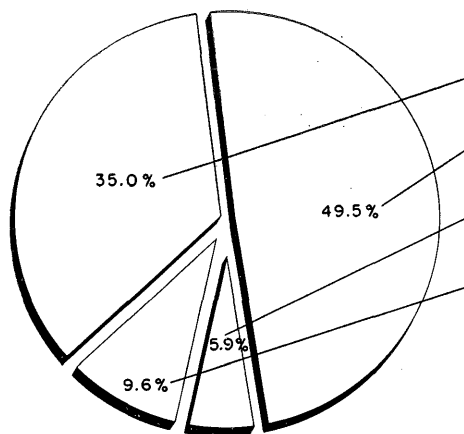
*This represents only new counties where work was done.

There is no sign of abatement in the rapid rate of drainage of surface waters in Minnesota. We are losing our small surface water areas at the rapid rate of 5% per year.



FINANCIAL STATEMENT

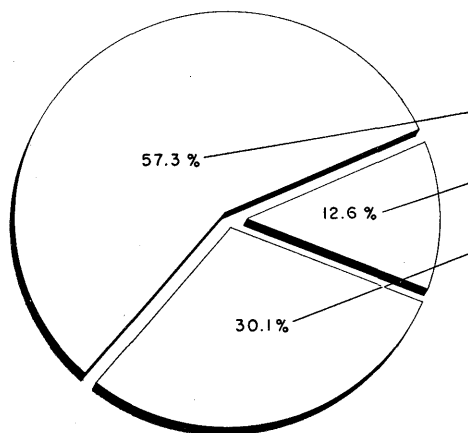
Receipts 1958



License Sales and Park Permits	\$ 4,246,891
Timber Sales, Ore, Rough Fish	6,006,925
Service Fees, Sales, and Fines	727,538
Federal Aid	1,167,735
	<u>\$12,149,089</u>

	LICENSES	SALES	FED. AID	OTHER	TOTAL
Admin.				35	35
Waters				17,110	17,110
Forestry	600	902,880	541,414	80,870	1,525,764
L. & M.	550	4,748,097		292,862	5,041,509
Game & Fish	4,005,144	353,526	626,321	127,372	5,112,363
Parks	240,597	2,422		209,289	452,308
Total	4,246,891	6,006,925	1,167,735	727,538	12,149,089

Expenditures 1958

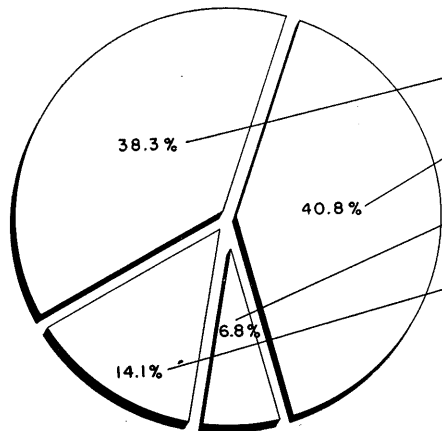


Salaries	\$5,367,367
Land, Buildings and Equipment	1,180,629
Supplies, Travel, Communications	2,814,944
	<u>\$9,362,940</u>

	SALARIES	SUPPLIES	LAND	TOTAL
Admin.	306,616	156,970	8,103	471,689
Waters	210,762	133,828	66,153	410,743
Forestry	1,618,041	653,459	104,884	2,376,384
L. & M.	352,020	63,045	11,531	426,596
Game & Fish	2,454,130	1,484,743	899,317	4,838,190
Parks	425,798	322,899	90,641	839,338
Total	5,367,367	2,814,944	1,180,629	9,362,940

DEPARTMENT OF CONSERVATION

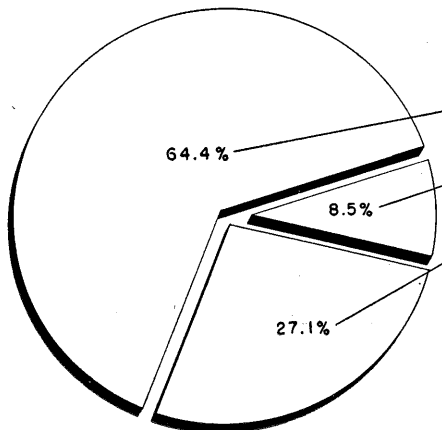
Receipts 1959



License Sales and Park Permits	\$ 4,269,407
Timber Sales, Ore, Rough Fish	4,550,273
Service Fees, Sales and Fines	750,267
Federal Aid	1,572,081
Total	\$11,142,028

	LICENSES	SALES	FED. AID	OTHER	TOTAL
Admin.	946			2,005	2,951
Waters				35,482	35,482
Forestry	600	799,622	684,708	82,555	1,567,485
L. & M.		3,443,293		297,200	3,740,493
Game & Fish	4,023,905	304,690	887,373	104,029	5,319,997
Parks	243,956	2,668		228,996	475,620
Total	4,269,407	4,550,273	1,572,081	750,267	11,142,028

Expenditures 1959



Salaries	\$ 7,006,966
Land, Buildings and Equipment	926,818
Supplies, Travel, Communications	2,948,432
Total	\$10,882,216

	SALARIES	SUPPLIES	LAND	TOTAL
*Admin.	1,506,898	475,798	16,744	1,999,440
Waters	259,755	135,946	1,035	396,736
Forestry	1,751,758	544,747	65,777	2,362,282
L. & M.	379,187	55,219	6,522	440,928
Game & Fish	2,638,225	1,408,320	776,417	4,822,962
Parks	471,143	328,402	60,323	859,868
**Total	7,006,966	2,948,432	926,818	10,882,216
*Includes Conservation Works Project Expenditure — \$1,499,197.52				
**Includes unliquidated Encumbrances				



FALL HARVEST — Indians of the White Earth Reservation near Big Rice Lake reap the bounty of rich wild rice beds in northern Minnesota.

Wetlands are receiving heavy use by the public. They are open to public hunting and trapping and furnish not only hunting for waterfowl, but also upland game and deer. In some intensively farmed areas they are the only natural cover remaining. These are variable "wildlife oases."

To help hunters locate these areas, a map showing the location of projects was prepared in 1959 and 1960 and distributed to sportsmen and division field personnel.

The land acquisition progress on major wildlife management units during the biennium is shown in the following table.

Land Acquisition on Major Wildlife Management Units

Name of Project	Location by County	No. of Acres Optioned	No. of Options	Cost
Barnesville	Clay	160.0	1	\$ 1,600.00
Carlos Avery	Chisago, Anoka	379.94	2	41,200.00
Hubbel Pond	Becker	120.0	1	2,700.00
Mud-Goose	Cass	1,374.22	3	13,705.45
Rothsay	Wilkin	600.00	2	4,420.00
Thief Lake	Marshall	280.00	3	2,825.00
Walnut Lake	Faribault	457.3	3	22,901.00
Whitewater	Olmsted, Winona, Wabasha	65.78	4	1,515.00
Totals		3,437.24	19	\$90,866.45

In addition to the lands which were purchased, 4,034.3 acres of state conservation area and federal lands were obtained at no cost and assigned

to the Section of Game for wildlife management and public hunting ground projects. Also, a total of 949.45 acres were licensed to the state for a 25 year period by the U. S. Corps of Engineers for wildlife management purposes in our Lac qui Parle, Orwell and Mississippi River Pool No. 3 projects.

Definite progress was made in the acquisition of public access sites to state hunting and fishing lakes and streams. The following is a break down of public access acquisition progress:

			Cost
Number of sites acquired	1958-59	45	\$ 20,022.00
Number of sites acquired	1959-60	58	27,733.00
Total number acquired during the biennium		103	47,755.00
Number acquired previous to July 1, 1959		128	45,586.50
Total Game & Fish areas obtained to date:		231	\$90,341.50

Refuge Development

The state owned refuges and public hunting grounds continued to be of prime importance for supplying good, wholesome outdoor recreation to thousands of Minnesota hunters. A major water control structure was constructed on each of the following units: Roseau in Roseau County, Mud-Goose Lake in Cass County, and Moose-Willow River in Aitkin County. The Roseau structure will permit more efficient control of available water and vegetation so as to improve wildlife habitat. The Mud-Goose dam on the Leech River impounds and controls the water on over 3,000 acres of desirable waterfowl and wild rice habitat. The Moose-Willow dam impounds nearly 1,200 acres of new waterfowl habitat; it is located approximately 6 miles southeast of Hill City. The Hubbel Pond Refuge and Public Hunting Ground 400 acre waterfowl reservoir in Becker County was flooded in 1959 by means of a dam constructed in 1957.

Research and Planning

Providing hunting and fishing for more people each year requires technical help today and research so we can do a better job tomorrow. Such services are the assignment of the Section of Research and Planning. The Section is made up of four units: (1) Fisheries Research and (2) Biological Services, which are financed from state license receipts; and (3) Game Research and (4) Surveys and Inventories, which are financed with help of Federal Aid funds.

Following are some of the highlights for the biennium:

During the biennium more than 2,000 samples of water, soils, manures, fertilizers and plant and animal materials were analyzed in the chemical laboratory and about 200 pathological examinations made of fish, mammals and game birds for the Department and the public. Control of aquatic nuisances—plants, algae, etc.—in public waters was supervised and 499 permits issued.

Sounding maps were made of 199 fish lakes and biological surveys made and survey reports prepared for 211 lakes for the use of managers. Thirty-

three trout streams were surveyed and surveys made on portions of the Rum, Minnesota and St. Croix Rivers. In all, there are now 2,309 fish lakes mapped and complete biological surveys on 1,236. These maps and surveys cover our more important fish lakes but, on a state-wide basis, we are about half through with the survey and mapping job.

Research continued on deer migration, movement, nutrition and life history. Special reflective collars were developed whereby it is possible to identify individual deer at distances of more than a quarter of a mile at night. The studies show that most deer have a home range of only a few miles and can therefore be easily "bottled up" in large refuges. Deer hunters were highly successful in 1959 when 104,355 deer were taken by resident firearms hunters and 52.7 per cent were successful.

Experimental studies on furbearers and predators included intensive control of predators on two areas, Mud Lake Refuge (in cooperation with the U. S. Fish and Wildlife Services), and Fraser Township in Martin County. It was found that coon, fox and skunk, rapidly repopulate areas that have been trapped out. Bounty payments have proven ineffectual for controlling fox populations.

Pheasant research was carried out at the game research station at Madelia. After a bumper year for pheasants in 1958, the population was down about 40 per cent (but about equal to the 15-year average) in 1959. The most likely cause was the late nesting season. Indications are that the pheasant crop in 1960 will be about the same size as in 1959. During the biennium pheasants have fared better outside the principal range; in those counties where there is a considerable amount of land placed in the soil bank.

Detailed study of 1959 pheasant nesting in Fraser Township, Martin County, showed that 45 per cent of the nests were destroyed by farming practices, 23 per cent by predators (including domestic dogs and cats) and 18 per cent from other causes. Most successful nests were in oats or along roads. None were found along fence lines which apparently serve as predator lanes.

Waterfowl research was emphasized: (1) relationship of land use to waterfowl production, (2) determining trends in breeding populations and in the hunter's kill, (3) obtaining information on migration and homing of waterfowl, (4) effects of disease and predation on waterfowl, and (5) gathering information on water fertility and other factors affecting production of birds.

Banding of young ducks continued, bringing the total to more than 30,000 which have been banded since 1953. From the bands and nylon disk bill markers, which have been also used recently, it has been demonstrated that there is a definite homing instinct in ducks—a factor to be taken into account when setting seasons.

During the biennium 56 shallow game lakes and marshes were surveyed and most of these mapped. Five watersheds with a total area of 429,430 acres were surveyed and mapped to determine potentialities for game management.

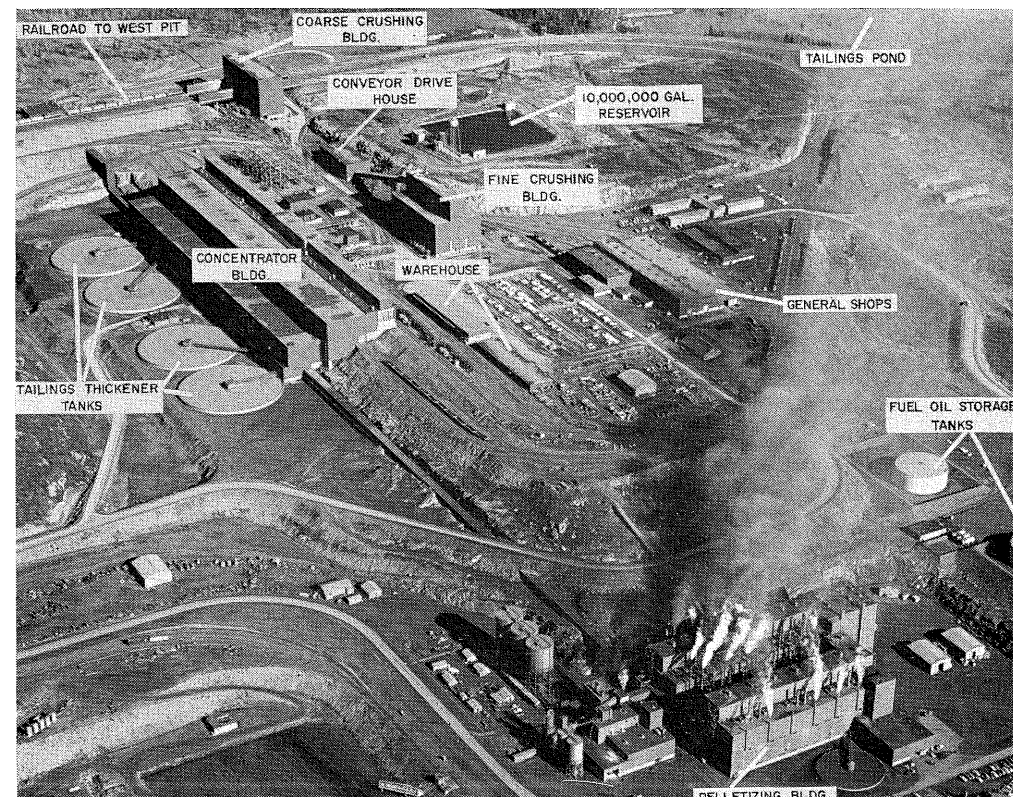
Lands and Minerals

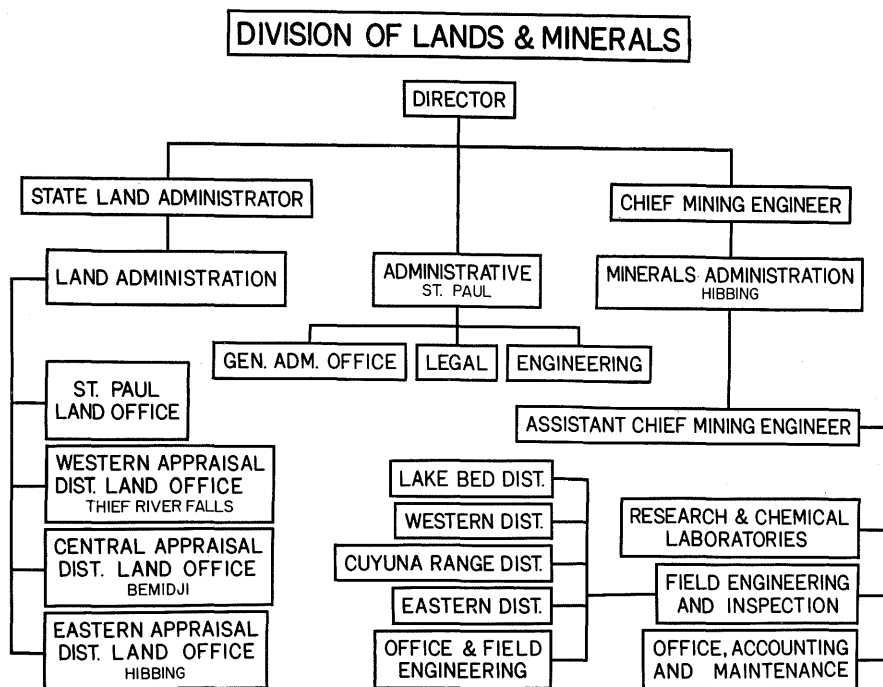
RAY D. NOLAN, Director

Under the Commissioner of Conservation, the Division of Lands and Minerals has administrative authority over approximately 2,300,000 acres of mineral, agricultural, non-agricultural and lakeshore lands; acts as agent for the public schools, the University and other educational and state institutions in selling or leasing state-owned lands and minerals; acts as agent for counties and local taxing districts in exploiting and leasing iron ore and other minerals located in tax forfeited lands; conducts research on low grade minerals; and promotes the exploration and development of minerals in areas where iron ore and other minerals are not known to exist.

The Division work is divided into two sections—one covering land, the other minerals, with headquarters for both in Saint Paul. The Minerals Section, under supervision of a Chief Mining Engineer, has an engineering research and chemical building at Hibbing, and an engineering office on the Cuyuna Range at Ironton. The Land Section, under the supervision of a

ERIE MINING COMPANY'S HOYT LAKES TACONITE PLANT — Aerial view of Erie's Taconite Plant which can process annually 22½ million tons of crude magnetic taconite into 7½ million tons of high grade taconite pellets that contain 64.00% iron. One-half of the material being processed is state-owned, and the royalties received from this state taconite will be added to the Permanent University Trust Fund.





Land Administrator, has land appraisal offices located at Bemidji, Hibbing and Thief River Falls.

Revenue and Activities

Lands and Minerals revenue for the biennium ending June 30, 1960, totaled \$6,877,847. \$6,389,621 of this was derived from iron ore and other minerals; and the balance, \$488,226 was received from sale of state land and timber and the rental of state lands. Over 95% of the total receipts was paid into the Permanent Trust Fund of the state, which totaled \$302,302,558, on June 30, 1960.

From the time of the first shipment of state-owned ore in 1893, until June 30, 1960, a total of 356,104,702 tons of royalty ore has been shipped from state-owned properties. Of this amount, 24,792,597 tons were crude taconite. Converting this tonnage of iron ore to steel and the steel into automobiles, the amount of iron ore that has been produced from state-owned mines to date would amount to 15 rows of automobiles, bumper to bumper, circling the world at the equator.

During the biennium, 32 state-owned mining units were active in producing 23,904,376 tons of royalty ore. Twenty-seven units were regular mines, two were stockpile units, one was a lakebed mine, and two were taconite quarries operated by Reserve Mining Company and Erie Mining Company. These two commercial taconite plants processed 18,408,399 tons of state-owned crude taconite during the biennium. The remainder of the roy-

alty ore, 5,499,977 tons, consisted of iron ore and concentrates produced by other state mining units. These figures are particularly impressive, considering that there was an economic recession in 1958 and that 1959 was marked by a nation-wide steel strike which resulted in the closing of most of the iron ore mines in Minnesota, as well as the rest of the country.

During the biennium, 10,741 acres of trust fund land in 21 counties were sold for \$116,425. Receipts from 2,050 leases which were issued totaled \$84,182. During the biennium 16,589 acres of tax forfeited land located in Conservation Areas and the Red Lake Game Preserve were sold, and this included 12,474 acres that were approved for sale by the Commissioner during this biennium.

Under the original Federal Land Grant Act, Minnesota was allotted certain lands for the support of public schools and other educational institutions, but there was a deficiency in the original conveyances of about 20,000 acres. During the past two years 7,600 acres of this deficiency has been conveyed to the state by the Federal Bureau of Land Management, all of which, except for a small acreage, will become a part of the Public School Trust Funds.

During the biennium, the Lake Bed Section continued the field examinations and investigations which were necessary in preparing the engineering data used by the Attorney General's office in litigating the ownership of minerals on the Little Pine River course near Emily on the Cuyuna Range, and also on Mud Lake. Preliminary work of establishing lake soundings was also completed on Black Hoof, Little Black Hoof, Black Bear and Miller Lake. Due to the possible expansion of pit operations at the Tioga No. 2 Mine toward Cavanaugh Lake, consideration was given to the possibility of partitioning the lake bed, using the geographic center.

The District Court ruled that the bed of O'Brien Lake, located on the Mesabi Range, belongs to the state. The court also ruled, however, that the tailings deposited on this lake bed belong to the mining company. Since this is, in effect, a trespass on state property, negotiations are now being made in an attempt to restore this lake to its natural condition or, in the event this is impossible, reimburse the state for damages.

As a result of the withdrawal from sale by the 1923 legislature of all lands bordering on public lakes and streams, the state still owns about 140,000 acres of land located on lakes, with a water frontage of 1,100 miles in 37 counties. During the biennium, 373 lakeshore lots and 22 public access areas were surveyed and platted on 13 additional lakes. A large portion of this work was done under a Conservation Work Projects program in effect during the latter part of 1958. Under this program, 11.4 miles of road were also built to provide access to these lakeshore areas. In 1959, an area adjacent to the City of Buhl, in St. Louis County, was also platted and the lots offered for public sale in connection with a proposed expansion of that city.

Mineral Development

Direct iron ore shipments from Minnesota are gradually being replaced by concentrated ore. During the 10-year period beginning in 1943, the percentage of concentrates shipped from all Minnesota mines gradually increased from 22.1% (15.4 million tons), to 30.4% (19.6 million tons) in 1952. In



RESERVE MINING COMPANY'S TACONITE QUARRY AND PRIMARY CRUSHING PLANT AT BABBIT — Upper right shows quarry where crude taconite is mined and is then hauled to primary crusher shown in center and what appears to be two silos to the left are storage bins where the ore is received from the crusher and loaded into the railroad cars to be hauled 47 miles to Silver Bay. Under Reserve's 120 million dollar expansion program, these units will be duplicated at Babbitt; the railroad will be double-tracked and the processing units at Silver Bay will also be expanded to increase the present capacity by 50 per cent to 9 million tons of pellets per year.

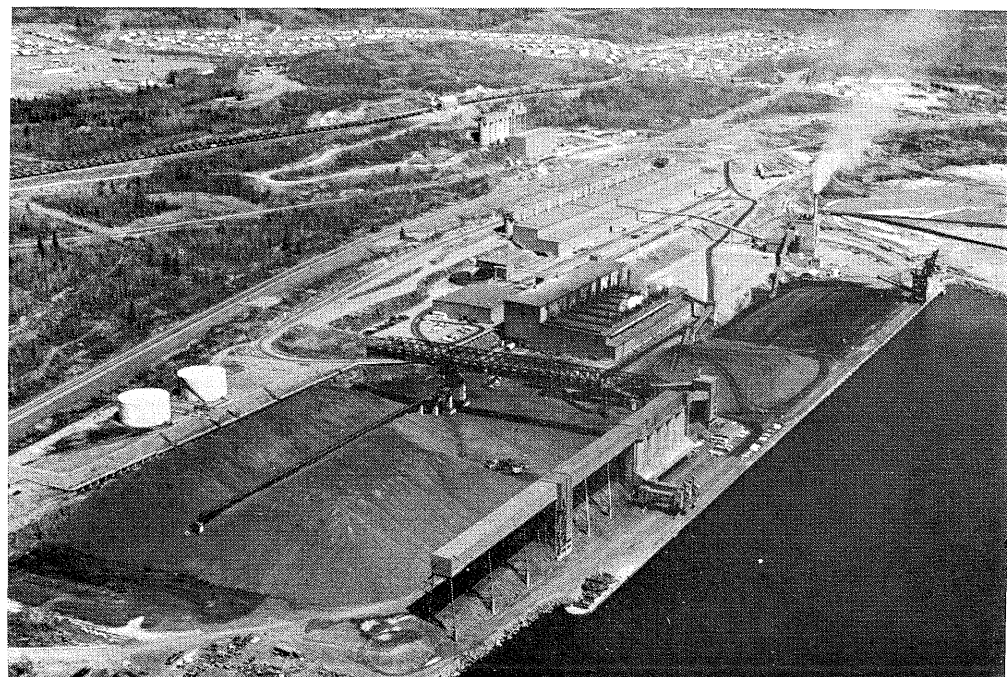
1953 when shipments totaled 81½ million tons, the largest in Minnesota's history, the percentage of concentrates increased to 33.1% (27 million tons). This included one million tons of taconite concentrates. By 1959 the percentage of concentrates shipped increased to 55.4% or 20.2 million tons out of a total of 36.5 million tons. The large percentage of increase over 1953 was mainly due to the 8.3 million tons of taconite concentrates shipped in 1959 which represented over 41% of the total. The percentage of iron ore concentrates shipped from state-owned mines has followed this same pattern, but to an even greater extent, for in 1941, 24% of the ore shipped from state-owned mines consisted of concentrates, and this percentage increased to 71% in 1959, not counting taconite. If taconite is included, the figure would be 87.5%.

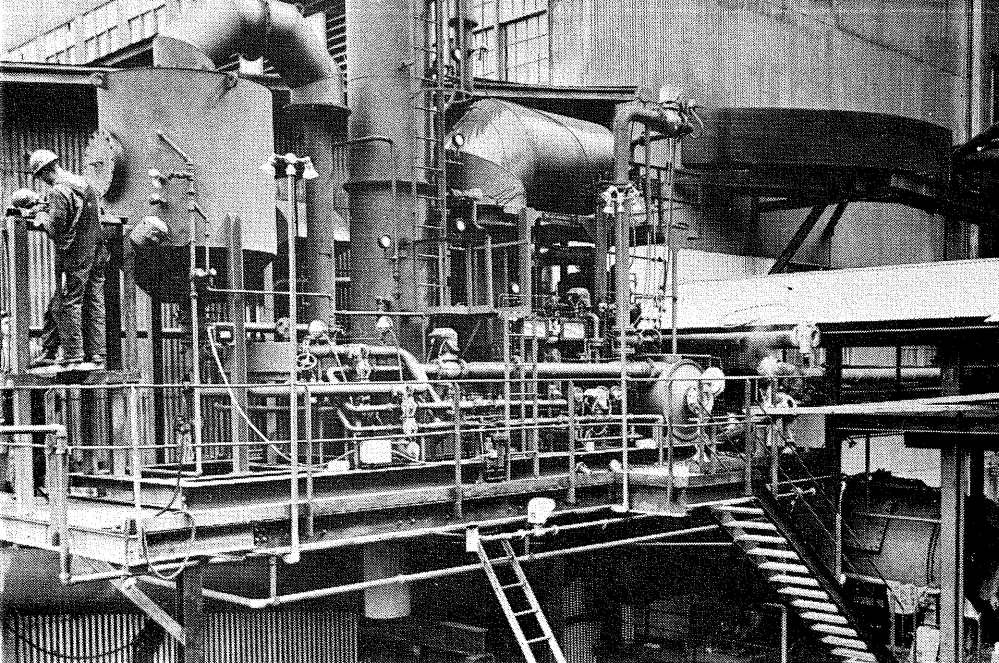
One serious problem that has developed in connection with the concentration of Minnesota iron ore is that while the percentage of concentrates shipped is constantly increasing, the grade requirements for these concentrates have also risen. Analyses of the total shipments of iron ore from the Mesabi Range in 1955 average 50.43% natural iron and 10.21% silica. In 1959 the total shipments from the Mesabi Range averaged 54.20% in natural iron and 8.91% silica. The only state mines that had shipments in 1959 equalling this average were the taconite projects. For many years, 10% has been considered the limiting point of silica. Much of the concentrates now being produced exceed this silica limit and must be graded off with better material. Indications now point to even higher grade requirements in the future—an acid (silica plus alumina), iron ratio of 5 to 1 or higher. This means that a concentrate containing 10% silica and 2% alumina would have to have a natural iron of 60% to be considered a high grade concentrate.

The Research Section processed and classified about 32,000 feet of drill hole exploration samples. Approximately 425 laboratory tests were made on samples of low grade ore, iron ore tailings, taconite, and samples that

were taken from the copper-nickel area in Lake and Saint Louis Counties. The Chemical Laboratory completed nearly 16,000 analytical determinations on samples from iron ore shipments, lean ore dumps and samples from tests that were conducted in the Research Laboratory.

RESERVE MINING COMPANY'S TACONITE PROJECT, SILVER BAY — Aerial view shows at extreme top new community of Silver Bay; upper center Reserve's railroad, car-dumper building and fine crushing plant. Below highway shown in center is quarter-mile long concentrator building and below this is the pelletizing plant. In the foreground are stockpiles and storage bins of high grade pellets ready to be loaded into ore boats. Lake Superior is shown in the lower right hand corner.





UNITED STATES STEEL CORPORATION'S SEMI-TACONITE PLANT, COLERAINE — This is the gas generating unit of the semi-taconite pilot equipment being built by Oliver Iron Mining Division adjacent to its Trout Lake iron ore concentrator near Coleraine. This facility will be used to develop methods for processing low grade non-magnetic iron-bearing rock called semi-taconite, which occurs predominantly on the Western Mesabi.

The semi-taconite material is heat-roasted in a rotating kiln which converts the non-magnetic hematite to artificial magnetite so that it can be concentrated by conventional magnetic separation equipment similar to that which is being used on the natural magnetite of the eastern Mesabi Range. Immense reserves of semi-taconite are located in the western end of the Mesabi Range.

Leading to a possible sale of copper-nickel units covering state lands in northeastern Minnesota, this division has drawn up a unit book that contains about 120,000 acres located along the gabbro contact line that follows a 70-mile strip in eastern Saint Louis County beginning at Duluth, a 10-mile strip in Lake County; and then, bypassing a part of the Wilderness Area, it continues for 23 miles and covers state lands located along the Gunflint Trail in Cook County.

Taconite Development

The Reserve Mining Company taconite plant located at Silver Bay started producing taconite pellets in October 1955. Although the original production capacity was rated at $3\frac{3}{4}$ million tons of pellets per year, the plant has now demonstrated its ability to produce $5\frac{1}{2}$ million tons of pellets per year. This year the operators began working on a \$120,000,000 program designed to increase their capacity from $5\frac{1}{2}$ million to over 9 million tons of pellets per year. Under this expansion program, the Reserve Mining Company will erect a second coarse crushing plant at Babbitt to receive crude ore from the western portion of their expanded pit. The 47 mile railroad between the mine at Babbitt and the processing plant at Silver Bay

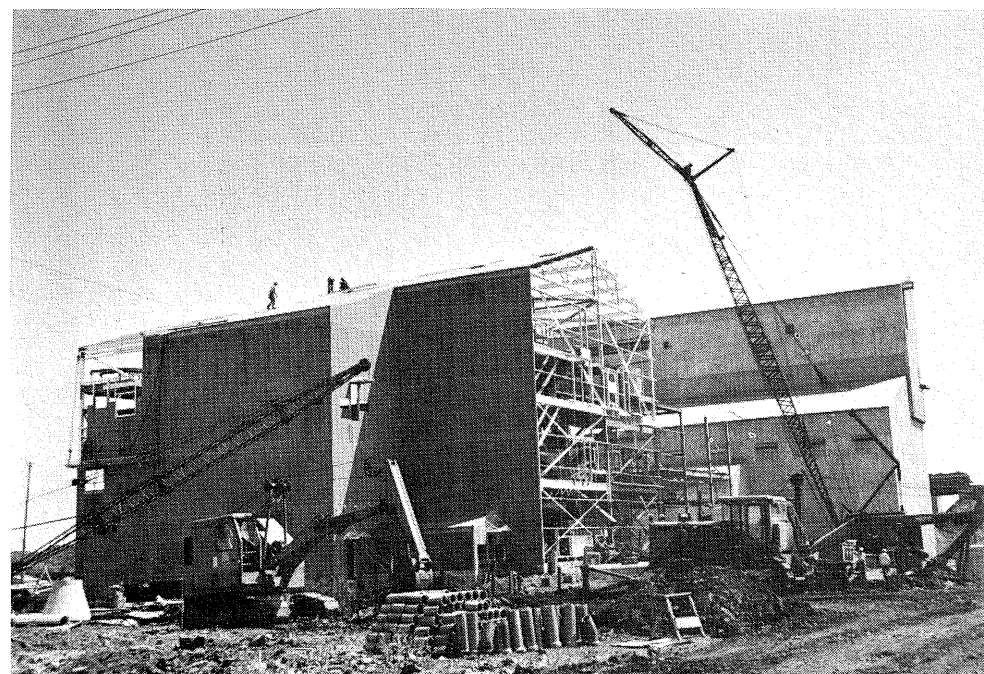
will be double tracked. The present car dump equipment at Silver Bay will be duplicated. In increasing the capacity of the fine crushing, concentrating and pelletizing plant at Silver Bay, the concentrator which is presently 1350 feet long, will be lengthened to 2150 feet as additional completed production lines are installed. Maintenance and repair buildings at both the mine and the plant site will be doubled in size, and the power plant, vessel loading equipment, etc., at Silver Bay will be enlarged. It is estimated that this expansion program will take three years to complete and that when completed, plant employment will have increased from 2200 employees at present to 3000 employees.

Erie Mining Company's Hoyt Lakes Taconite Plant which is located near Aurora, Minnesota, started producing taconite pellets in the fall of 1957. This 300 million dollar project included quarries, crushing, concentrating and pelletizing facilities located near the new Town of Hoyt Lakes, a 74 mile railroad which hauls the finished pellets to Taconite Harbor located on the north shore of Lake Superior, and which in addition to the loading dock and harbor contains a power plant and a town for the Erie employees. The capacity of the present plant is $7\frac{1}{2}$ million tons of high grade taconite pellets. About one-half of the crude taconite that will be processed by this plant is owned by the state. During the biennium 18,368,979 tons of state-owned crude taconite were concentrated in this plant. It is ex-

SHERMAN HEAVY MEDIA CONCENTRATING PLANT NEAR BUHL — This new Sherman Iron Ore Beneficiation Plant being built by United States Steel's Oliver Iron Mining Division near Buhl, will concentrate, beginning in 1961, low grade ores produced in Oliver's nearby Monroe and Sherman Mines, and the plant will include heavy density, cyclone and spiral concentrating units.

Erection of this plant was made possible because permits to store iron ore tailings in Three Mile Lake and to change the channel of Buhl Creek were obtained from the state through the cooperation of the citizens of Buhl and Chisholm.

The plant will have an annual capacity of $1\frac{1}{2}$ million tons of high grade concentrates and will provide more than 100 new jobs for a period of about twenty years.



pected that eventually the capacity of this plant will be expanded to 10½ million tons of high grade pellets per year.

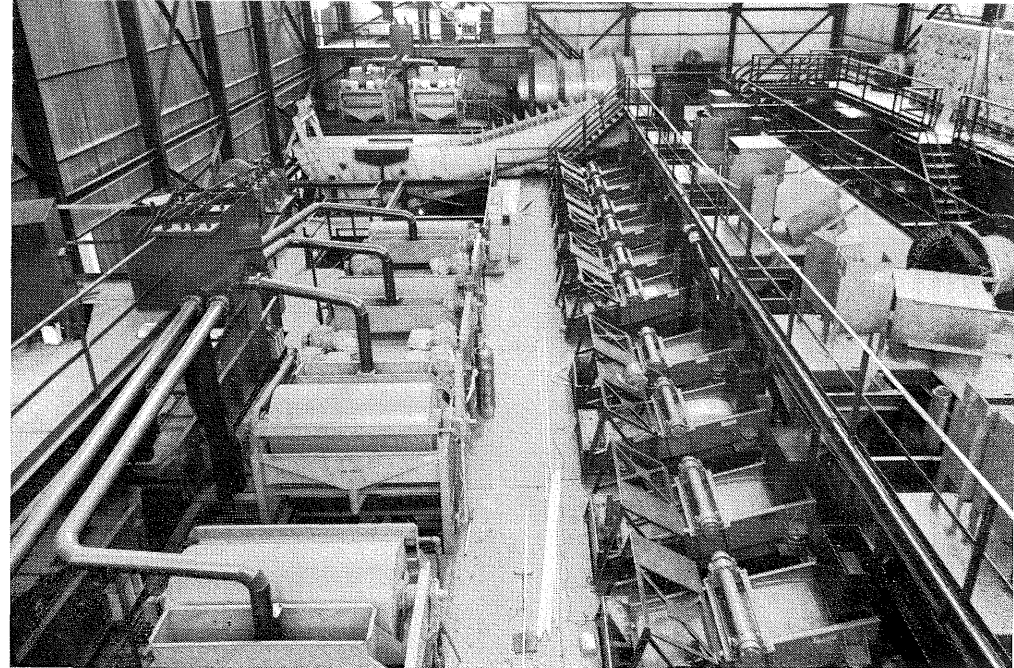
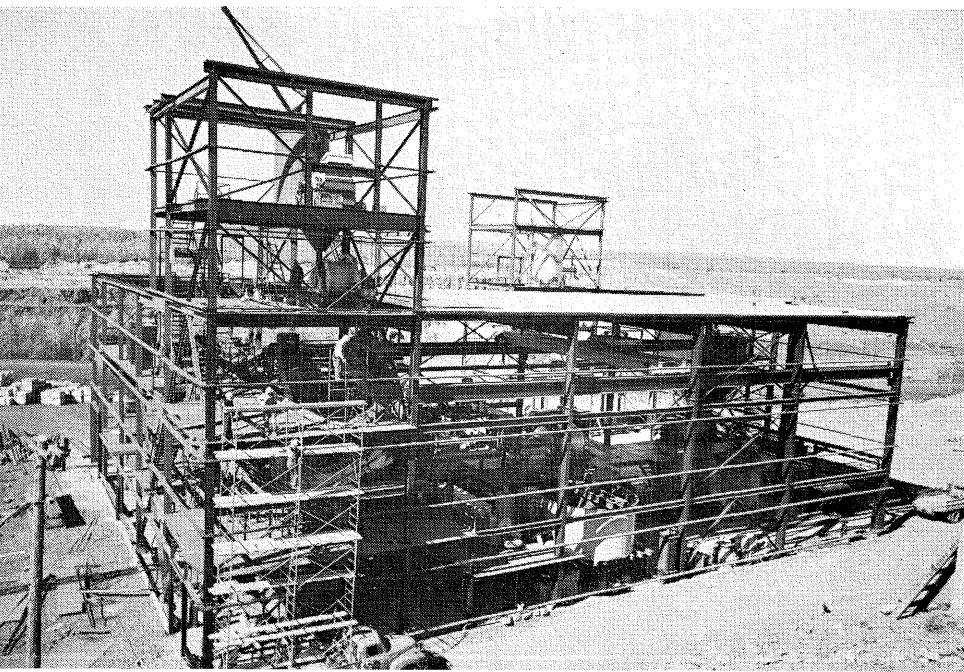
Since 1953, Oliver Iron Mining Division of the United States Steel Corporation has had a taconite pilot plant in operation near Mountain Iron with a rated capacity of ½ million tons of taconite concentrates per year. Concentrates are shipped to Virginia for agglomeration, and shipments from this plant during each of the last five years have exceeded 600 thousand tons. No definite announcement has been made by officials of the United States Steel Corporation in regard to the construction of a large commercial taconite plant in Minnesota.

Semi-Taconite Development and Direct Reduction

Legislation to encourage another step in the development of low grade marginal ore was passed by the 1959 Legislature and approved by Governor Orville L. Freeman by extending the taconite tax benefits to a large tonnage of marginal ore which is known as semi-taconite. Immense reserves of semi-taconite are located in the western end of the Mesabi Range. This is non-magnetic iron-bearing material, softer than unaltered taconite or compact rock; and to produce high grade ore from this material will probably require either roasting, flotation or some other complex method of concentration.

Many of the articles and talks dealing with our iron ore situation indicate that Minnesota is being relegated to the position of a minor producer

M. A. HANNA COMPANY'S SEMI-TACONITE PLANT, NASHWAUK — Construction view of Hanna Company's \$2,000,000 experimental plant in the Nashwauk—Cooley area. Legislation to encourage another step in the development of low grade marginal ore was passed by the 1959 legislature and approved by the Governor by extending the taconite tax law benefits to a large tonnage of marginal ore which is known as semi-taconite. The erection of this plant and the Oliver's semi-taconite plant at Coleraine followed the passage of this legislation.



INTERIOR HANNA PIERCE MINE HEAVY MEDIA PLANT, NORTH HIBBING — Heavy media separators are shown to the left; the metal (ferro silicon), which is used in separating the commercial iron from the waste material, can be recovered and used again for this purpose. To the right are the magnetic separators that are used in recovering this heavy media metal. The concentrating plant has a capacity of one million tons of high grade ore per year, and about 325 men are employed in the mine and plant.

of iron ore. Iron ore is still the state's most important non-renewable resource; and while it is admitted by those within and without the industry that Minnesota is in a transition period because of the depletion of its direct shipping and easy-to-concentrate ore and the somewhat slow development of its taconite industry, the future still is not as black as it has been painted.

Two of the largest iron ore producing companies have each announced the erection of heavy media concentrating plants to be built on the Mesabi Range. The M. A. Hanna plant is to be located at Hibbing, and the United States Steel Corporation, Oliver Iron Mining Division's plant will be located between Buhl and Chisholm. Another large mining firm is considering the possible erection of a direct reduction iron-steel plant to be located either on the Iron Range or in Duluth. A fourth firm now engaged in direct reduction processing in other districts has made no announcement, but is working with the University Mines Experiment Station in conducting direct reduction tests on Minnesota low grade ore.

Development of a commercial process of concentrating semi-taconite would increase employment, and would not only make available additional millions of tons of iron ore from this source, but successful development of the semi-taconite would tend to speed up the processing of the hard compact non-magnetic taconite which exists in large quantities in the central and western sections of the Mesabi Range.

State Parks

U. W. HELLA, Director

OUR JOB

The Division of State Parks is responsible for the operation and maintenance of the state park system, now comprising 68 units, of which 36 are regular state parks, five are state memorial parks, six are recreational reserves, one is a scenic reserve, 11 are wayside areas, and nine are monument areas.

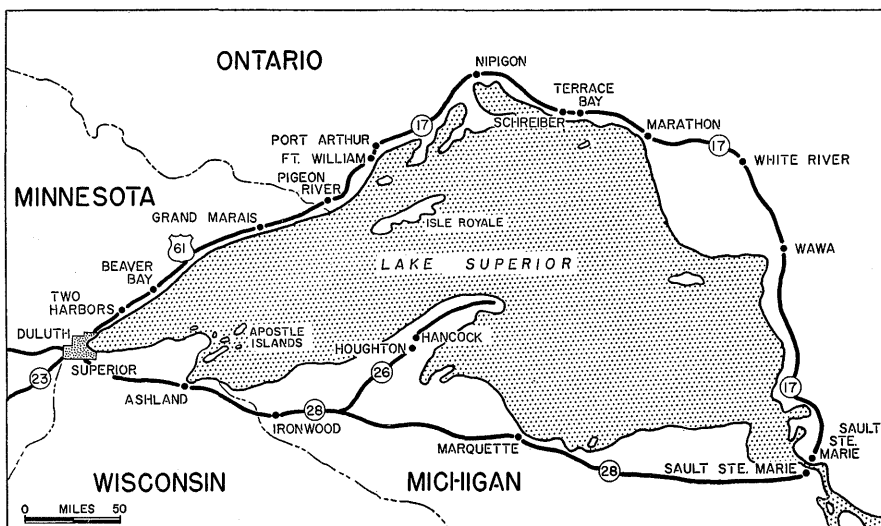
In 1889, the first unit, Camp Release, was established; followed by Itasca in 1891.

In 1935 the administration of the system then consisting of 27 units and 50,000 acres was consolidated in a legislatively established Division of State Parks.

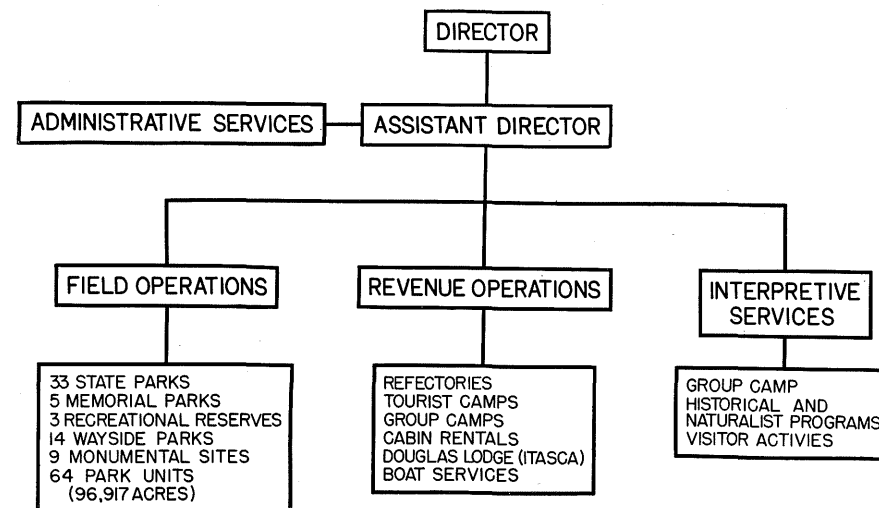
In 1942 at the close of the depression-borne conservation programs and the outset of World War II, the system has grown to 54 units and 63,000 acres.

By 1953 the system constituted 61 units and 84,000 acres. This year is significant because the impact of mounting public use of the parks crystalized into legislative awareness and action on correcting the inadequacies of the

GREAT CIRCLE ROUTE—A magnificent new drive completely circling Lake Superior is now complete. Opening virgin lands and magnificent vistas rarely seen by "outsiders," the breathtakingly beautiful 1,080-mile circle route will stimulate tourist travel, serve as a link in the 4,500 mile Trans-Canada highway, cut 323 miles from the present route between Toronto and Fort William-Port Arthur. For Minnesotan's it will mean tremendous increases in travel through the wonderland of the north country, now that the final link in the chain of "Superior Beauty" has been forged.



DIVISION OF STATE PARKS



system and the run-down conditions of physical developments in the then existing parks.

In the six years since, resulting from Administrative and Legislative concern, 9 major park units totaling over 17,000 acres have been established or authorized—two parks were transferred to the more proper jurisdiction of municipalities and over 1,300 strategic acres added or authorized for addition to 13 major existing park units.

Today the system constitutes 68 units and 106,000 acres.

OUR RECORD (1955-1959)

Park improvements during the past biennium totaled \$254,000. An additional \$450,000 was provided from the Emergency Work Program.

Estimated visitations in the 1958 calendar year totaled 2,900,000 representing a 7% average annual increase since 1942. Tourist camping has increased enormously. A total of 211,580 park visitors participated in the Naturalist program last year. An additional 100,000 used self-guiding nature trails.

Revenue producing services in state parks pay the personnel costs of 125 part time employees for the operation of 25 refectories, 36 campgrounds, lifeguard services in 15 areas, boat rentals in 14 areas, two golf courses, and the Douglas Lodge operation. This fund totaled \$335,632.10 for 1959 as compared to \$222,917.15 in 1957.

Camping as an activity is typical of the unprecedented increase in the demand for park services. Camper fees increased from \$17,705.50 in 1957 compared to \$41,797.35 in 1959, an increase of 241%.

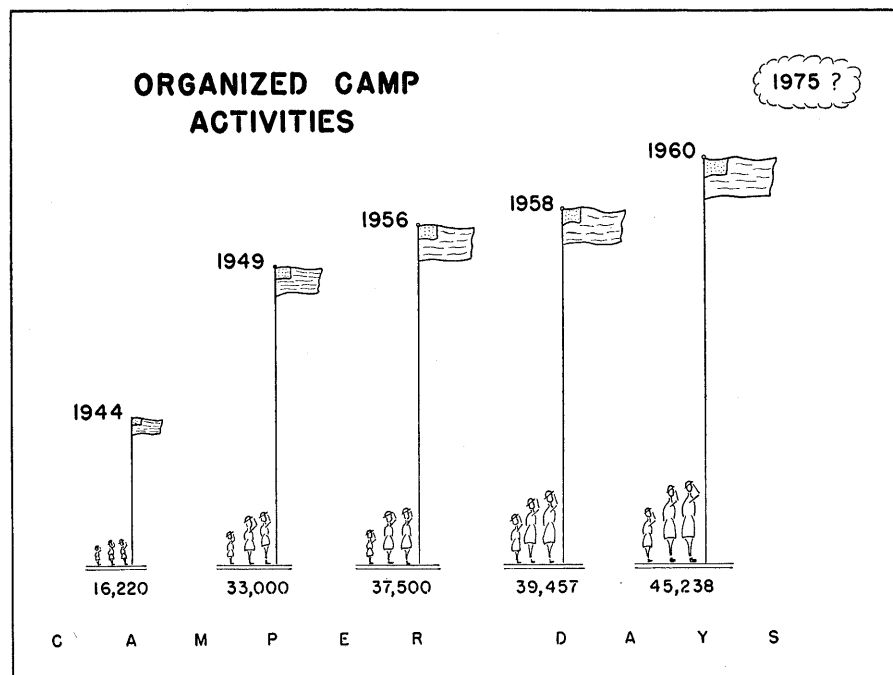
OUR PROGRAM (1960-1970)

Land Acquisition

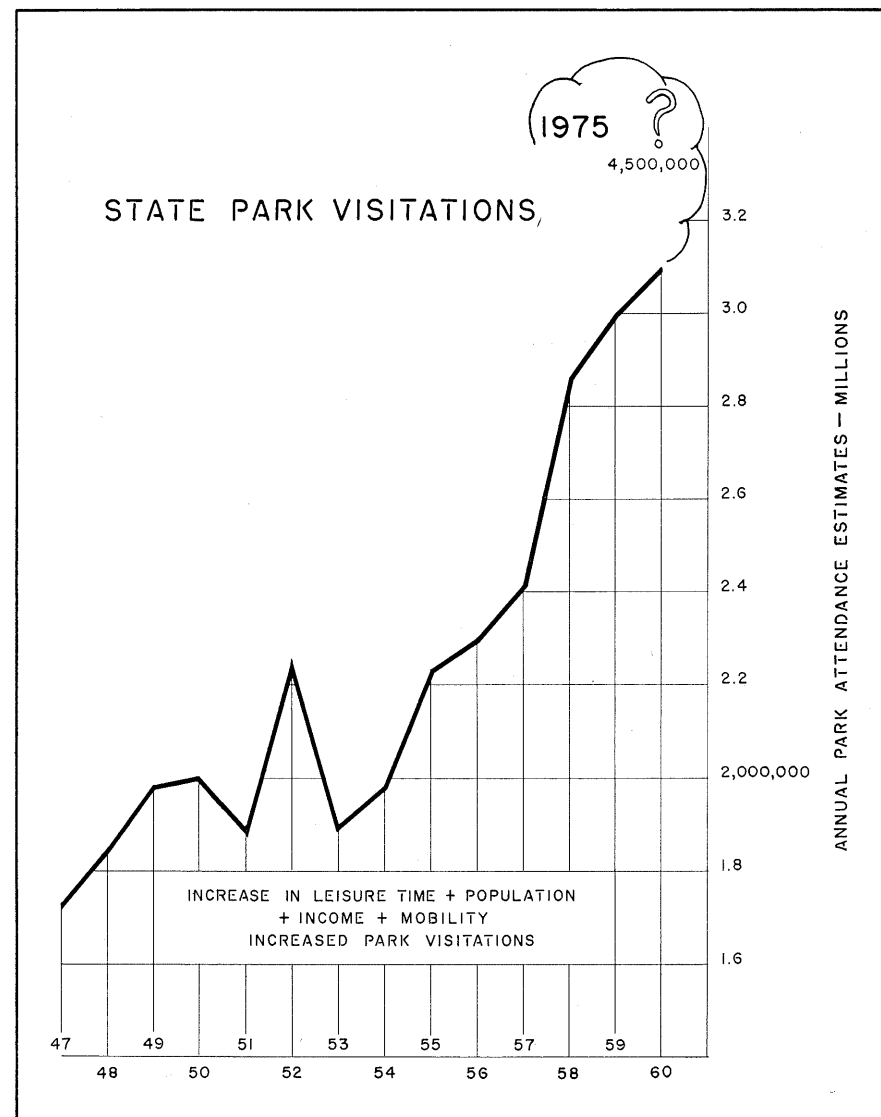
Areas for conservation purposes are increasingly difficult to acquire. Of prime importance is the expansion of choice major parks while lands for such expansion are still available. Of 35 outstanding major units 18 are under 500 acres in size—considered minimum for an area classified as a State Park. Recommended additions to the 22 existing parks are estimated at \$464,900 over the next ten years. In addition there are other strategic locations upon which no monetary value can be placed until specific location, desirable acreage, land ownership and degree of local participation in acquisition has been determined. Basic land data will be collected on all areas suitable for park purposes. Assistance in this study is expected from the National Outdoor Recreational Resources Survey and the National Park Service in connection with their Mission 66 Program.

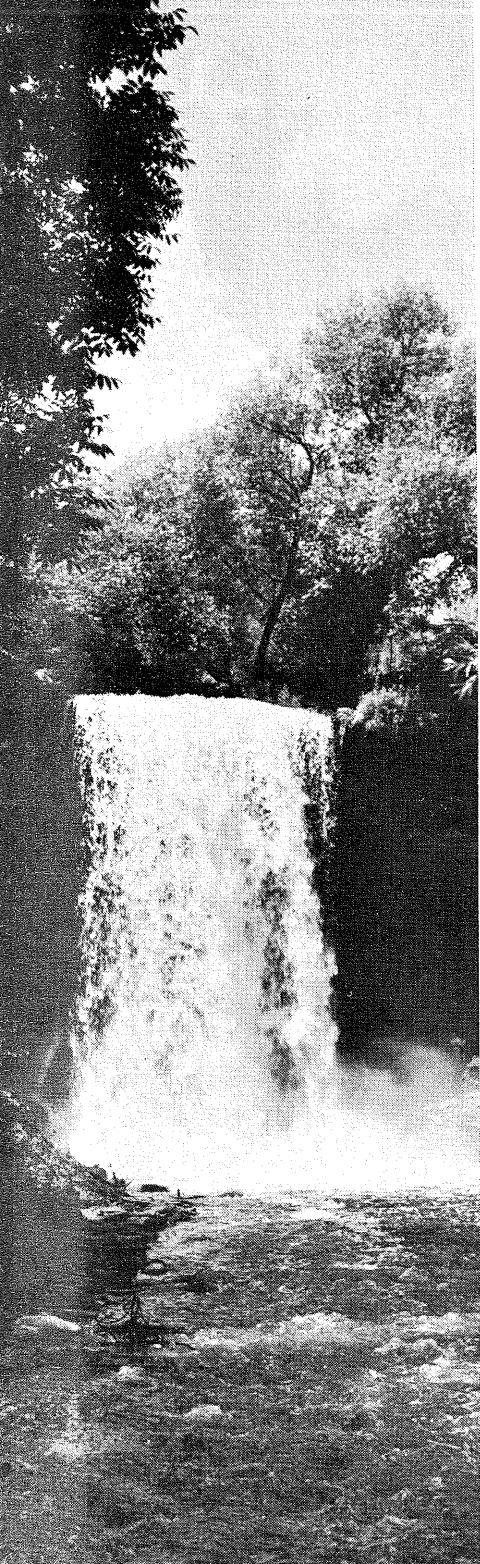
Park Development

Recommended is a ten-year program of development totaling \$7,850,000. Compared with the National Park Services \$786,000,000 ten-year pro-



gram of development and the State of California's single year appropriation of \$47,000,000 for State Parks, these recommendations are most modest when it is considered that Itasca State Park has a greater attendance than do 15 of the 28 National Parks and Gooseberry and Interstate State Park attendances exceed those of 4 of the 28 National Park areas.



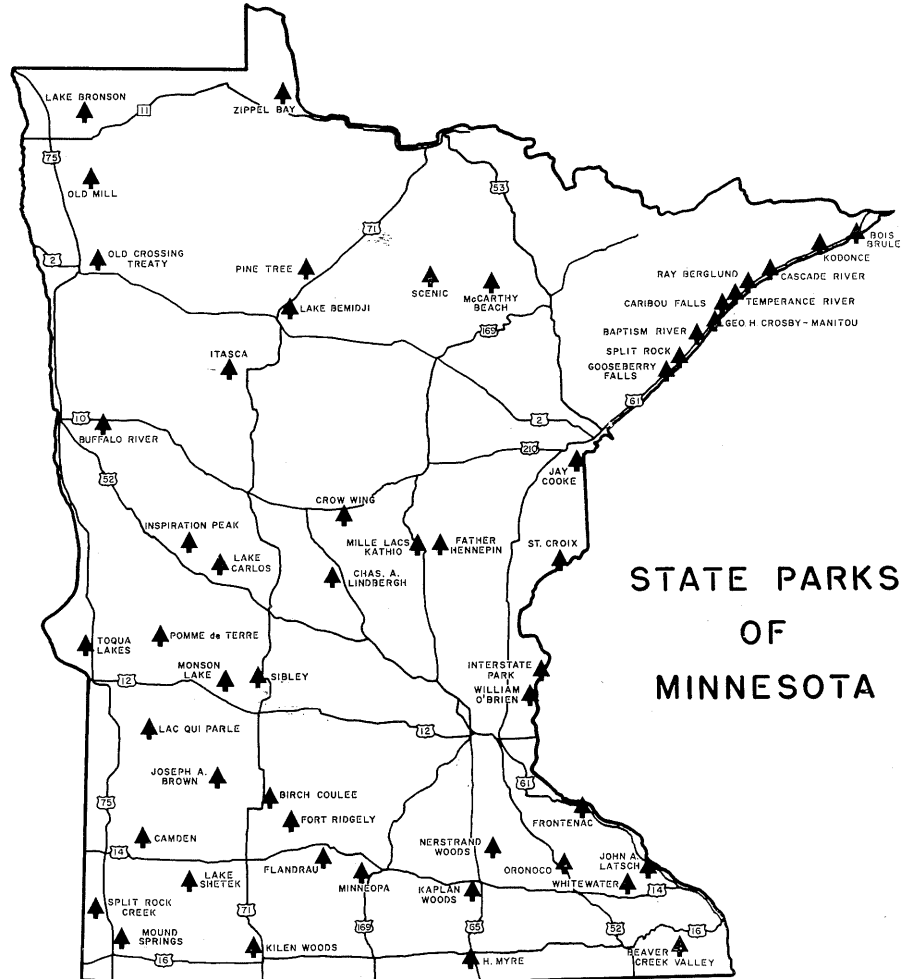


TEN YEAR CAPITAL IMPROVEMENT PLAN

1961 - 1971

Tourist Camps	\$2,368,000
Picnic Areas	1,481,000
Administrative Centers	1,455,000
Group Camps	425,000
Bathing—Boating	704,000
Miscellaneous	1,417,000
(Winter Sports, Foot Trails, Service areas, Riding Stables and Bridle Paths, Historical Museums, etc.)	

\$7,850,000



State Park Operation

It is recommended as essential for the physical well-being of employees as well as adequate service to the public that 12 major use areas be provided with an assistant capable of relieving the park superintendent and that seasonal clerical positions be established in 20 parks to relieve the park superintendent of the detail of necessary record keeping. It is further recommended that a staff position of a Chief of Interpretive Services be authorized.

It is recommended that the present complement of seasonal resident interpretive specialists (park naturalists) be expanded to ten parks. Seasonal naturalists are presently employed in three state parks and self-guiding nature trails are provided in seven others through the cooperation of the Museum of Natural History, University of Minnesota.

It is recommended that equipment be modernized in consultation with equipment specialists to determine proper equipment for a specific job or park. Out of 65 truck and tractor units, presently being operated by this Division, 28 are 10 to 21 years old. This obviously reflects high maintenance and operational costs.

Following Chart of Receipts by activities reflects total volume of business conducted and specific types of use growth.

WORKING CAPITAL INCOME

FISCAL YEARS

June 30—July 1

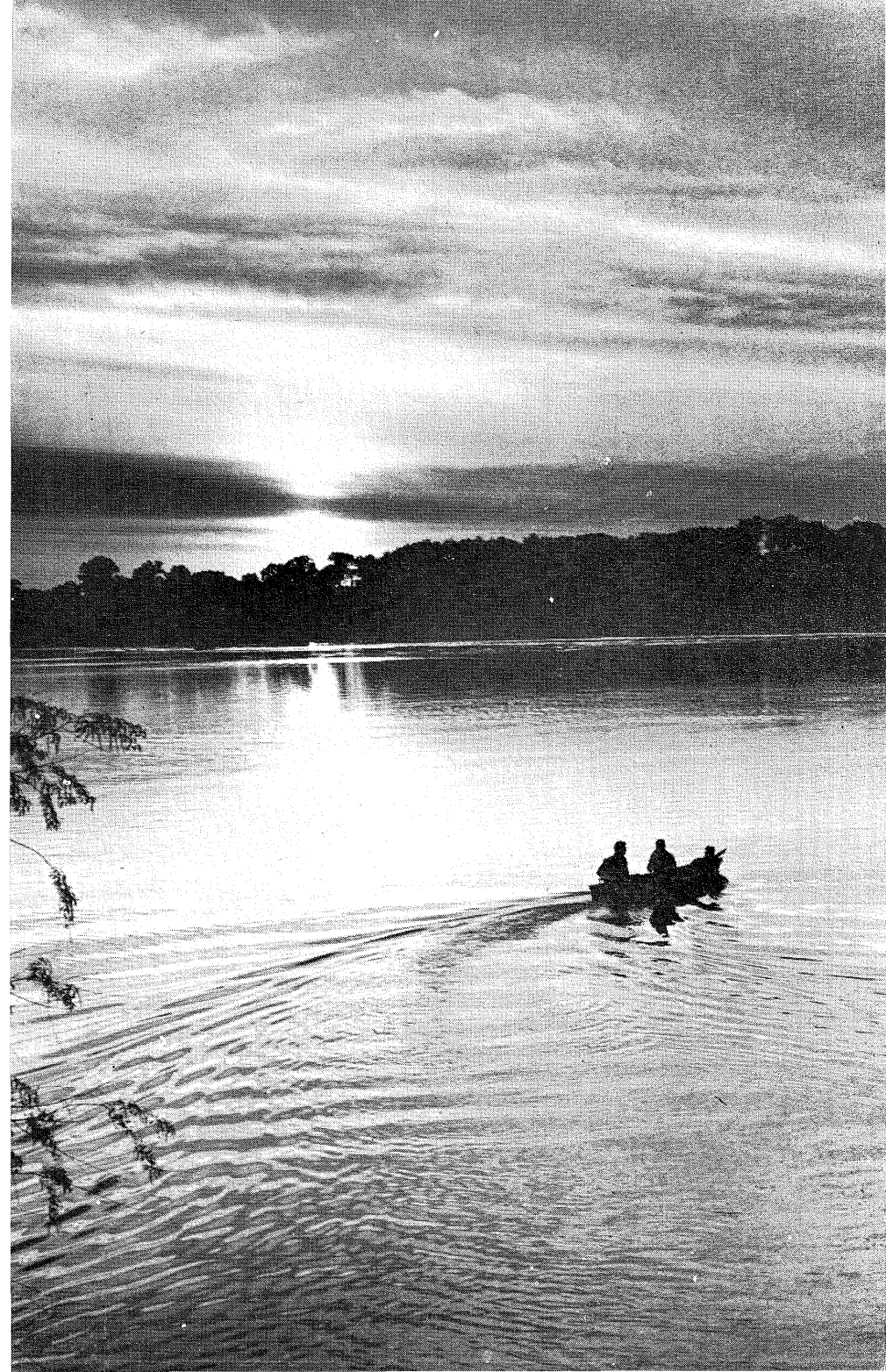
Fiscal Year	Total Income	Refectory	Camping	Housing	Boats	Miscel.
1954	\$191,292.52	\$133,273.31	\$ 7,274.70	\$22,848.00	\$ 7,582.00	\$20,314.51
1955	218,623.05	147,975.32	10,941.80	29,677.85	9,461.85	20,566.23
1956	221,559.01	146,859.25	14,115.30	26,910.30	8,222.65	25,451.51
1957	222,917.15	139,078.95	17,705.50	31,122.75	10,054.00	24,955.95
1958	310,699.96	185,707.59	34,554.36	40,107.55	10,163.00	40,167.46
1959	335,632.10	203,655.38	41,797.35	40,975.45	11,725.55	37,468.37
1960	405,175.29	235,968.38	68,244.50	40,861.00	13,640.85	46,460.56

9 Full Time Employees, 143 Seasonal Employees (19 lifeguards—balance Cooks, Custodial Workers, Clerks and one executive.)

1958—\$124,548.50 Budgeted for labor.

Above table shows monetary growth in major activities, which is in direct relation to the increased use figures. The column headed "Miscellaneous" includes group camps, launch, bathhouse, utilities and all special services.

It is recommended that permissive legislation be enacted whereby counties or groups of counties can join to establish county park areas. In 1955 the Citizens League of Minneapolis advocated and were instrumental in having such legislation introduced. It was a composite of the best of multi-county park type of legislation in the country. Unfortunately, the act as introduced was amended to be applicable to rural Hennepin county only and amended again in the last session to include the City of Minneapolis. We sincerely hope that future legislatures will consider amending the law back to its original form so that other counties or groups of counties within the state can take advantage of it. The State of Iowa, four years ago, enacted a model county park law.



Waters

SIDNEY A. FRELLSEN, Director

It is to be expected that during the second century of its statehood, Minnesota will experience greater demand for water to be used by its increasing population, expanding industry, and more productive agriculture. Not only is the total water use increasing but our higher standard of living is requiring more water per capita.

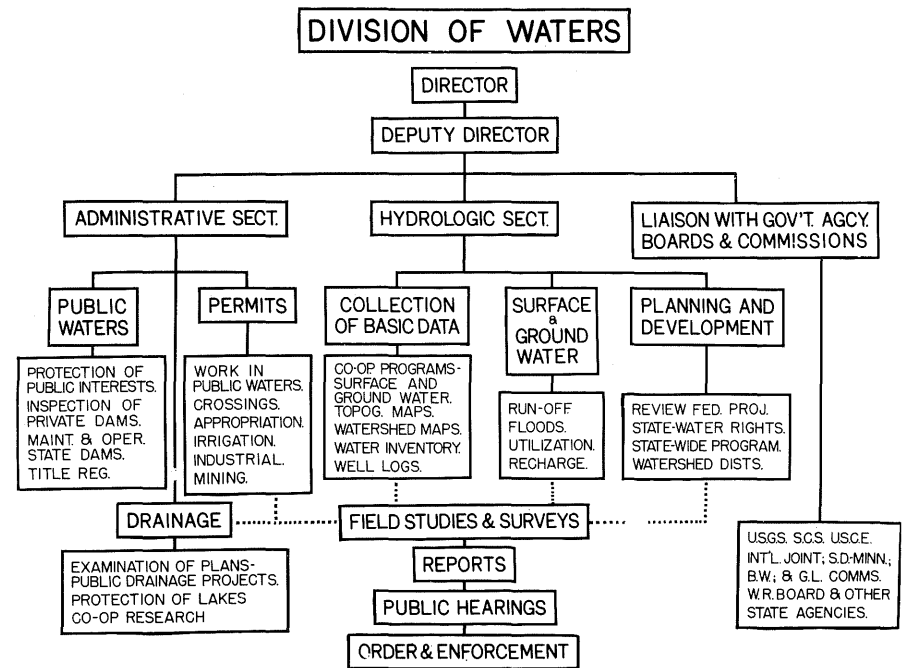
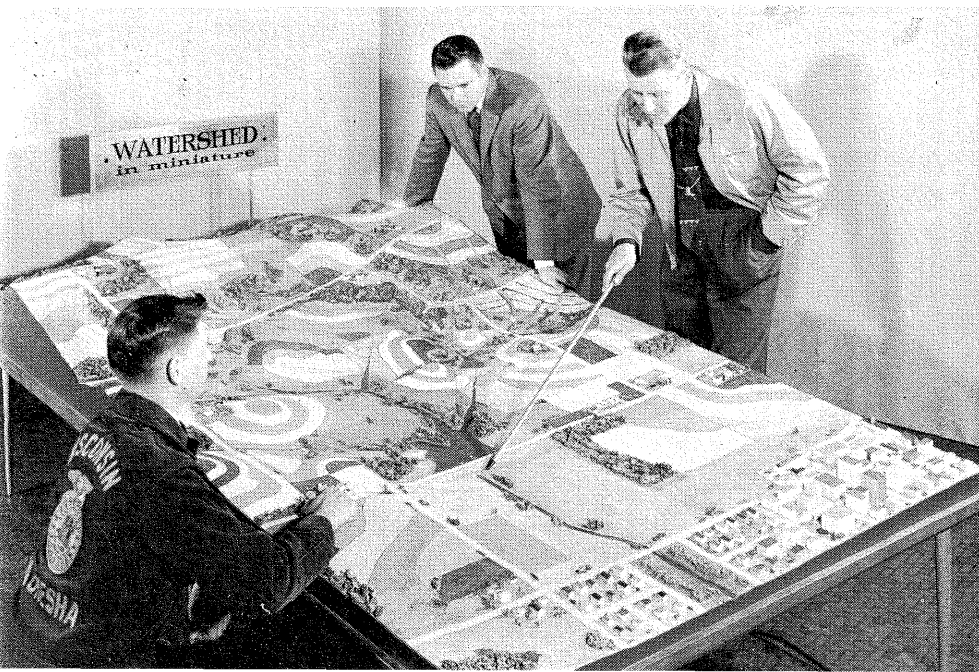
Industry has devised processes that require less water for producing goods to partly offset the increasing demand of the expanding economy, but at the same time has found new and diversified uses for water.

Minnesota is unusually fortunate in the abundance and purity of its water resources, and, generally, increased demands will not overtax available supplies.

The watershed approach to management of water resources should be encouraged and utilized, where circumstances are suitable, and integrated with state policies and objectives by action at the state level. "Water for Tomorrow" is our obligation to future generations.

An unavoidable consequence of expansion will be additional possibilities for the pollution of lakes, streams, and underground sources. While the state has made commendable progress in the purification of municipal and indus-

SMALL WATERSHED — Scale model of a 1,280 acre typical "small watershed" provides a practical demonstration of how to make running water work. Designed to show how to bring upstream water problems under control, this model was widely exhibited in Minnesota to teach lessons in flood prevention and water conservation.



trial sewage, the pollution control program must be continued if the quality of our waters is to be maintained.

If our abundant water resources are to be developed without overtaxing supplies in some localities while water is wasted in others, the program of hydrologic studies and data collection now being carried on must be continued. As new needs are discovered the program must be adapted to the changing conditions. Opportunities for the development of water resources must be utilized, and the data now being gathered and the studies which are under way will aid in recognizing opportunities and in developing them wisely.

Conflicts will arise in the future much as they have in the past. An example is the clash of recreational interests with other water users where the fluctuation of reservoirs used for storage detracts from the pleasure of those who desire stable water levels for boating and for shoreline beautification.

Improved water management practices and increased public awareness of the importance of water will be the major factors in providing an efficient water management program for the future.

As water use problems develop, solutions will be worked out. The wisdom of these solutions will depend upon our foresight in studying our potentialities.

At least 210 of the 320 state dams for which the division is responsible

have been visited one or more times during the biennium. These visits were for the purpose of inspection, repairs, or modifications. More than 100 visits were made for specific work on the dams or dikes ranging from placing or removing stop logs to pouring fixed concrete weirs.

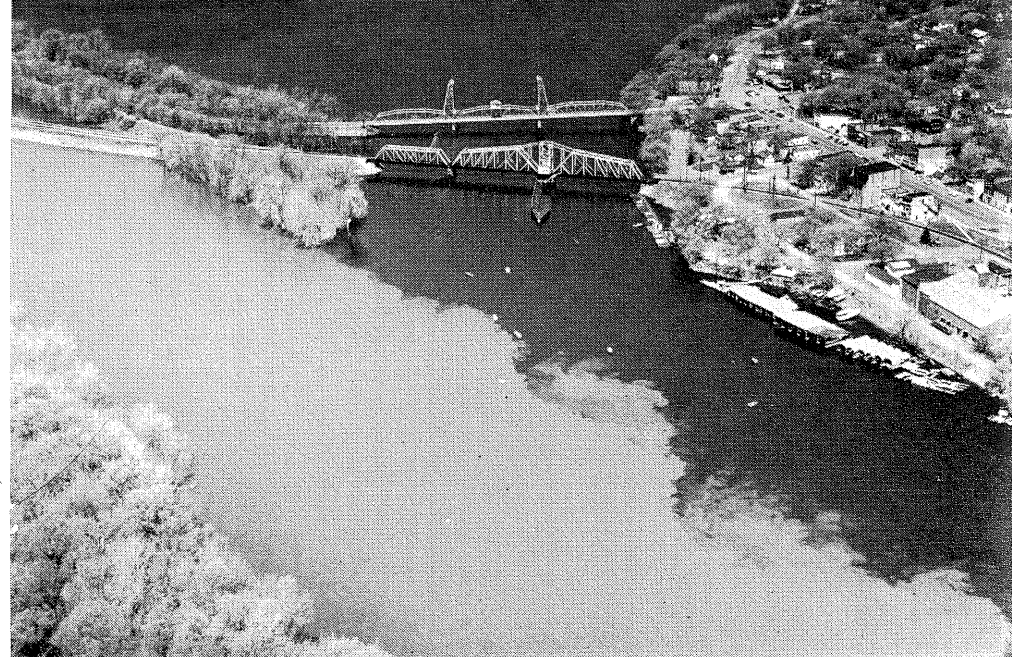
Modification of the Mountain Lake dam in Cottonwood County and the Bronson Lake Dam on the South Fork of Two Rivers in Kittson County was completed and paid for with funds appropriated for that specific purpose. The work was done under contract.

Custody of eleven dams has been transferred to counties and municipalities since 1951 upon application by local authorities. This is done whenever it is determined that the operation of the dams is mainly of local concern and that the public interest would be better served by having the dam under responsible local control.

Constitutes a revolving fund to which receipts from all State Park revenue operations are credited and from which disbursements for the cost of such operations are made. Authorized costs include payment of salaries, repairs, construction, purchase of equipment, and purchase of merchandise for resale.

Division of Waters personnel attended 30 public hearings and testified in 14 court cases during the 15th biennium. They also attended 51 conferences and committee meetings in Minnesota, and 12 out of state conferences

MIRROR OF MISMANAGEMENT — Time and tested watershed management techniques have healed the deep scars of erosion in the Whitewater Valley near Elba, Minn. Unharnessed flood waters tore this great gash in the earth, washed away tons of soil before the Conservation Department instituted its watershed management program throughout the Whitewater — today a tourist Mecca.



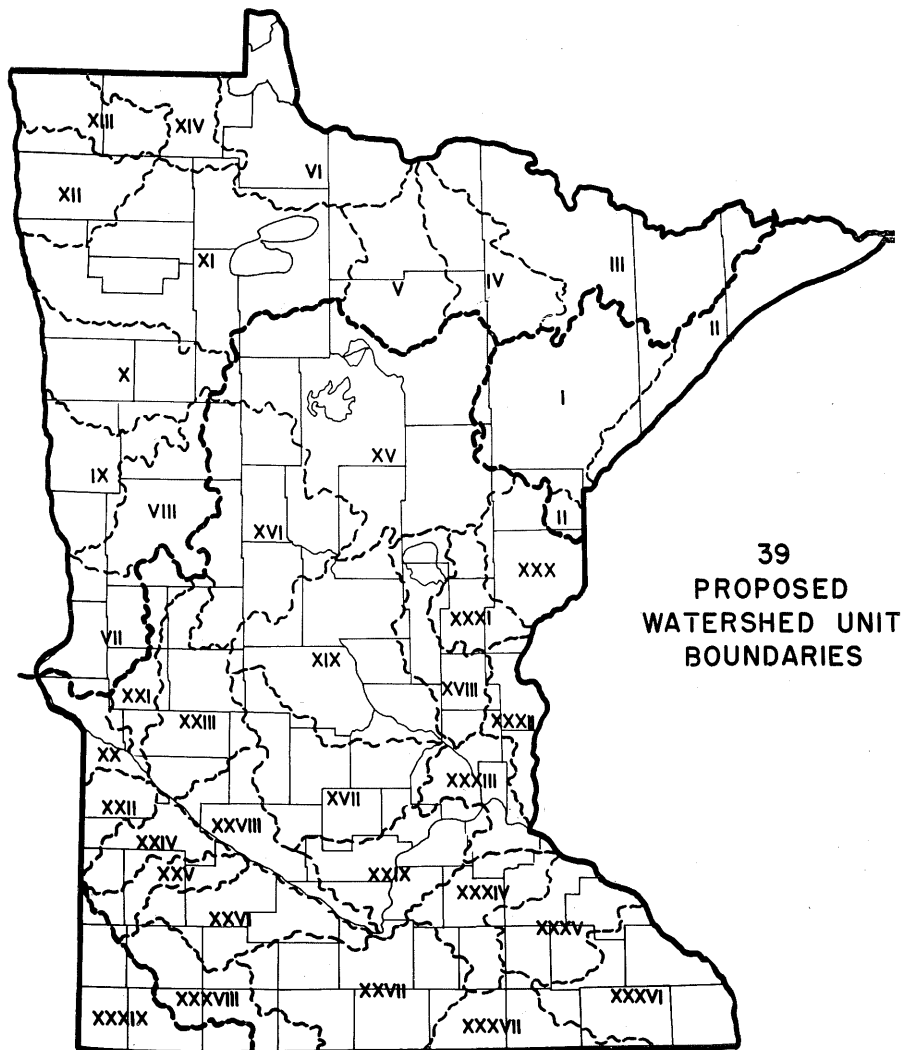
OLD MAN RIVER — Draws a line. It is a line between siltation-pollution — and the clear waters of the St. Croix river, as illustrated by this revealing aerial photo at the confluence of the St. Croix-Mississippi off Prescott, Wis.

which dealt with water during the 15th biennium. In addition, division representatives attended 17 meetings concerned with departmental administration.

Much of the activities of the Division of Waters is concerned with the preservation, protection and improvement of our lakes and streams, and with administration of the state laws applying to all public waters. Field surveys and investigations are commonly made for the following purposes:

1. To maintain, protect or restore the natural outlets of lakes where the natural conditions at the outlets may have been altered by public or private drainage projects, or by tampering.
2. In response to complaints of high or low water levels, to determine the cause of these conditions, which may be due to obstructions, either natural or artificial, at the outlet or in the outlet stream, or by culverts of insufficient capacity, improper design or construction.
3. Lake restoration — to investigate the feasibility of restoring lakes whose value for public use has been impaired.
4. Lake improvement — to investigate the feasibility of the proposed construction of new dams or the modification of existing dams, the construction of diversion works to increase the water supply of a lake, or of channels to facilitate recreational navigation.
5. For the determination of natural ordinary high water mark and the

WATERSHED UNITS



WATERSHED UNITS — Recognize no political subdivisions. They are Nature's own subdivisions, established over eons of time. In Minnesota, as the map illustration shows, there are 39 major watershed units, or geographic areas, wherein terrain naturally channels tributary flow and surface runoff to a single major stream above a given point. The watershed may be large or small. Average size of the 39 units is 2,150 square miles. The largest is 7,068 square miles; the smallest, 668 square miles. Each watershed unit, therefore, is a natural sector of land, possessing some degree of similarity with respect to geology, hydrology, climate, topography, soils and vegetative cover. Man has merely copied the divisional boundaries which Nature has established through the test of time.

natural runoff elevation of lakes, to be used as evidence where needed in controversies involving public and riparian rights.

6. To obtain evidence to be used in enforcing the statutes applying to work in the beds of public waters, or other statutes of the state water code.

During the biennium a total of 104 such surveys were completed. Six of these surveys required the services of a consulting hydraulic engineer for the determination of natural ordinary high water mark.

Studies and Reports

Division of Waters Bulletin No. 10, entitled, "Hydrologic Atlas of Minnesota," was published in April, 1959. Besides presenting an overall view of the state's water resources and water activities, it treats separately each of 39 watershed units into which the state is divided for study purposes. Written in non-technical language and liberally illustrated with maps and graphs, it makes accessible to the public much information needed for understanding these subjects. It has been widely distributed to public libraries, high schools and colleges, and to public agencies concerned with administration of water.

The Division of Waters was requested to prepare a report on the water problems of the Minnesota River Valley by the Interim Commission which was established by the legislature in the extra session of 1959 to study these problems. The report deals with floods and flood protection, irrigation, recreation, and the economic and development problems of the valley. After presentation to the commission, the report has been republished as Bulletin No. 13 of the Division.

Water resources and needs of the Minneapolis-St. Paul metropolitan area is the subject of a study by the Division of Waters which was nearing completion at the end of the biennium.

Stream-gaging Program

Basic data on the flow of water in streams and on the fluctuations of water levels in both streams and lakes is collected by the U. S. Geological Survey in cooperation with state and local agencies and with other departments of the federal government. All funds contributed by state and local cooperators are matched by an equal amount of federal funds allotted to the Geological Survey for this purpose.

As of June 30, 1960, there were 113 year-round gaging stations in operation from which discharge data for Minnesota streams were collected. In addition, records of water stages were being collected at 41 sites on rivers, lakes, and reservoirs. Partial discharge and stage records were being collected at 79 high-stage gaging stations.

The cooperative program with the Division of Waters currently comprises 46 full-time stream-gaging stations and 24 lake stage stations. In addition, the Division of Waters regularly collects stage measurements on 19 lakes from observations reported by field personnel of the Department of Conser-

vation, and occasional records of lake stages are acquired from lake surveys and investigations.

Well Records

In connection with the 1955 statute requiring filing of well records with the Division of Waters, a concerted effort on the part of Division personnel to establish closer contact with well drillers throughout the state and to emphasize cooperation between the division and drillers has resulted in a considerable increase in the number of well records filed: from 246 in fiscal year 1959 to 788 in fiscal year 1960.

Inventory of Public Waters

Continued progress has been made toward completion of the inventory of lakes 10 or more acres in area. Compilation of the data, including the names, locations, areas, and identification numbers, on a county basis, has been completed for 58 counties that together make up about 44% of the total area of the state.

A recent study of the boundary waters reveals that their total area within the state lines is 3,203 square miles and that just over two-thirds (2,212 square miles) is in Lake Superior. Not considering streams which only cross the boundary and do not run along it, there are 78 distinctly separate lakes and streams involved. These boundary waters range, in total size, from a short stream, which is the outlet of Mountain Lake on the Canadian Border, estimated to have a water surface area of 1 acre to 20,364,000 acre Lake Superior.

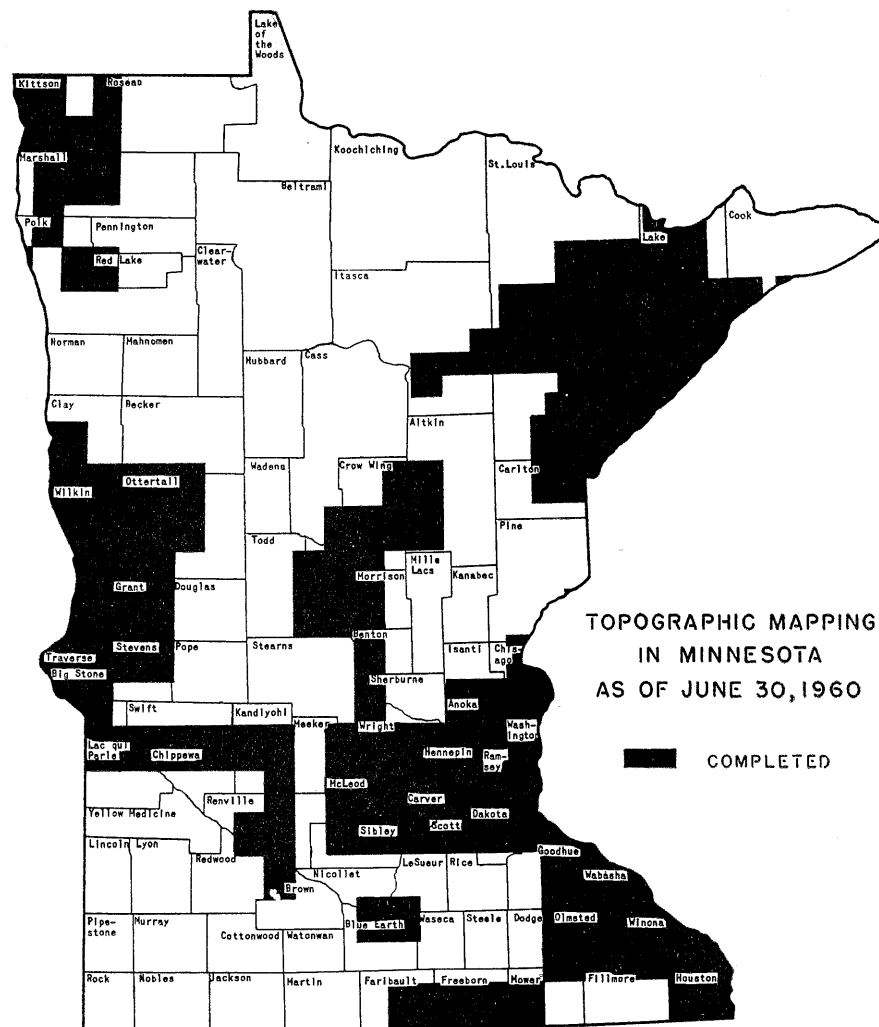
Topographic Mapping

Topographic mapping of the state has progressed steadily. Currently, the program is being financed under cooperative agreements between the U. S. Geological Survey and two state agencies, the Department of Conservation and the Iron Range Resources and Rehabilitation Commission. All work is done by the Geological Survey, and all state funds contributed are matched by an equal amount of federal funds. Coordination and planning of the Department of Conservation program is done by the State Mapping Advisory Board, which meets annually to receive reports of work accomplished and requests for additional areas to be mapped. A substantial amount of mapping was also done under a program paid for entirely by federal funds.

During the biennium new maps were published for approximately 7% of the area of the state, and field surveys, aerial photography, and office compilation on a number of additional quadrangles was completed.

The legislature appropriated to the Department of Conservation for this purpose \$50,000 for each year of the 1957-1959 biennium. For 1959-1961 this was reduced to \$36,000 each year. The Iron Range Resources and Rehabilitation Commission allotted \$50,000 for this purpose for each year of the biennium. However, a shortage of revenues due to the steel strike caused a curtailment of this program on October 1, 1959.

TOPOGRAPHIC MAPPING



TOPOGRAPHIC MAPPING — Progress in Minnesota is reflected by this map. Good maps are indispensable in the study of problems bearing on all phases of conservation activity. Topographic maps, which show elevations of land and water surfaces, are especially valuable in solving problems concerning the development and management of land and water resources. Much time and money is saved by their use in making preliminary studies for determining the feasibility and approximate cost of proposed projects. Since 1949, Minnesota has made excellent progress — thanks to the vision of Legislators — in topographic mapping. At present, about 36.2 per cent of the state is satisfactorily "topographic-mapped." This work is being done by the U. S. Geological Survey, chiefly under cooperative agreements with the Minnesota Conservation Department and the Iron Range Resources Rehabilitation Commission.

MINNESOTA DEPARTMENT OF CONSERVATION

ADMINISTRATION

George A. Selke,
Commissioner

Clarence Prout,
Deputy Commissioner

Hartley Nordin,
Deputy Attorney General

Robert J. Owens,
Engineering Services

Carl W. Moen,
Information

Howard B. Munson,
Operational Services

Robert J. Brown,
Personnel

DIVISION OF FORESTRY

E. L. Lawson,
Director

Earl J. Adams,
Deputy Director

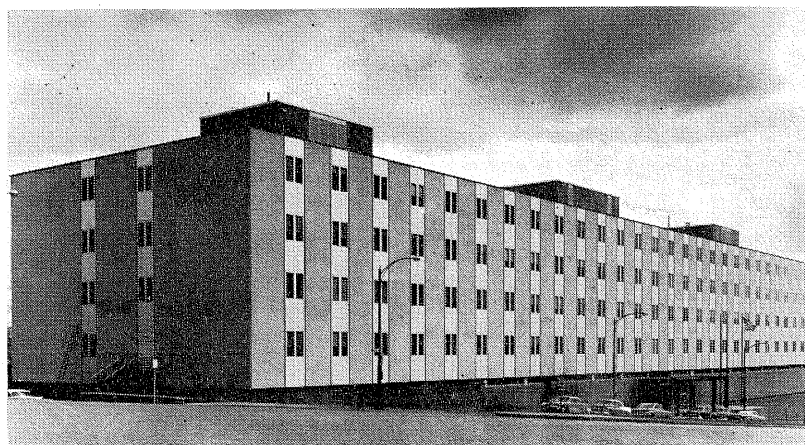
Richard L. Knox,
State Land Management

Emil Kukachka,
Cooperative Forestry

DIVISION OF GAME & FISH

James W. Kimball,
Director

Gordon B. Wollan,
Deputy Director



ABOUT OUR NEW HEADQUARTERS

The Centennial Office Building was completed and occupied in February-March 1960. Air-conditioned and designed for office efficiency, the new building is 101 feet by 459 feet. The Department of Conservation occupies the entire third floor.

ABOUT OUR FRONT COVER

The cover illustration is an authentic pen-sketch reproduction of the Split Rock Lighthouse by Chet Kozlak, Historical Society artist. It is the site of a proposed new state park on the North Shore.

For Information write: Department of Conservation, Centennial State Office Building, 658 Cedar Street, Saint Paul 1, Minnesota or Telephone: CA. 2-3013, Ext. 2457 or Ext. 3336.

God has given us the Earth for our life. It is a great entail. It belongs as much to those who follow us as it does to us, and we have no right by anything we may do or neglect to do to involve them in unnecessary penalties or deprive them of benefits which are theirs by right.

— Ruskin.

John B. Moyle,
Research and Planning

Francis W. Johnson,
Warden Service

David B. Vesall,
Game

Hjalmar O. Swenson,
Fisheries

DIVISION OF LANDS & MINERALS

Ray D. Nolan,
Director

R. D. Hultengren,
State Land Administrator

Roy C. Pascoe,
Chief Mining Engineer

DIVISION OF STATE PARKS

U. W. Hella,
Director

John H. Martin,
Deputy Director

Ralph Welte,
Northern District Supervisor

Norman Reitan,
Southern District Supervisor

DIVISION OF WATERS

Sidney A. Frellsen,
Director

Kenneth W. Pederson,
Deputy Director