# BIENNIAL REPORT

# 1962 - 1964





# MINNESOTA

## CONSERVATION DEPARTMENT

STATE OF MINNESOTA
DEPARTMENT OF CONSERVATION
SAINT PAUL 1

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

*It is our pleasure to transmit to you the Seventeenth Biennial Report of the Department of Conservation in compliance with M.S.A. 84.03.*

*The purpose of this report is to present factual information concerning the activities, accomplishments, and future needs of the department. It is presented in simplified form for purposes of economy. Sufficient copies have been printed to supply only a limited public demand.*

*Submitted by,*

*Minnesota Department of Conservation*

MINNESOTA DEPARTMENT OF CONSERVATION

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Saint Paul, Minnesota 55101

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Earl J. Adams, Deputy Director

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WATERS

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* * * *

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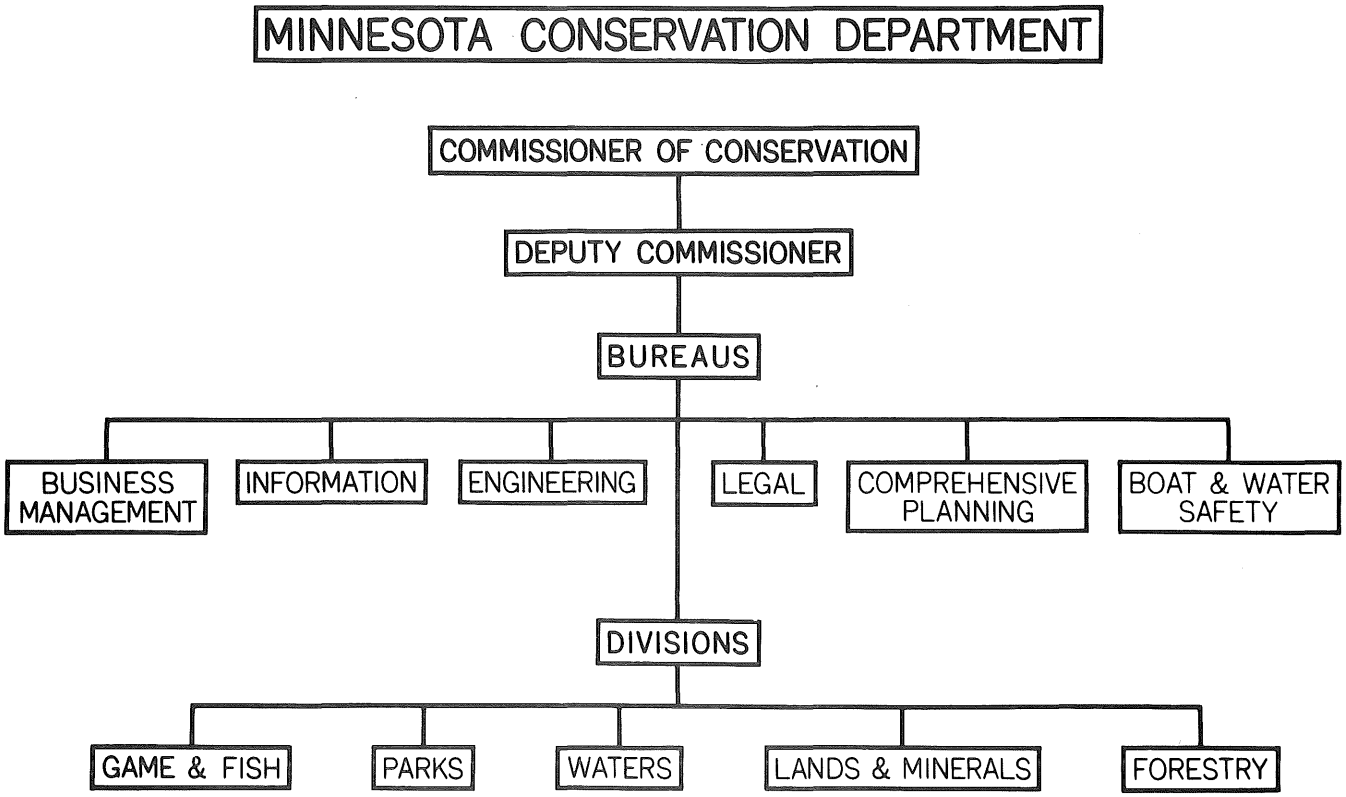
# Administration

The Conservation Department we know today was established in 1931 when separate conservation agencies were consolidated. The mission of the Conservation Department is to conserve and to promote the wise use and management of our state's natural resources: Its parks, lands, mineral's, waters, forests and wildlife.

The Commissioner of Conservation is the executive head of the department and is appointed by the Governor. The Commissioner determines the policies which govern the activities of the various branches of the department. He is by law an ex-officio member of the State Soil Conservation Committee, the Water Pollution Control Commission, and the Iron Range Resources and Rehabilitation Commission. The Deputy Commissioner of Conservation is appointed by the Commissioner and serves in the unclassified service. Attached to the Commissioner's office are six staff bureaus: Boat and Water Safety, Business Management, Comprehensive Planning, Engineering, Information, and Legal.



## Authority

Laws of 1931, Chapter 186, established the Department of Conservation administered by a five-man commission. In Laws of 1937, Chapter 310, the commission was abolished and authority vested in a Commissioner of Conservation.

## History

In 1931 the Minnesota Legislature established the Department of Conservation. The Department combined three previously independent organizations (Forestry, Game and Fish and Waters) and subsequently encompassed two more divisions (Lands and Minerals and State Parks). Forestry was first established in 1911 as the Minnesota Forest Service. The first Game and Fish organization was the three-man Fish Commission created by the Legislature in 1874. The birth of the Division of Lands and Minerals was delayed approximately two years after 1931 because the State Auditor refused to relinquish administration of lands and minerals on constitutional grounds. The Division of State Parks was created by an act of the 1935 Legislature as a unit of the Department of Conservation. Historically, the Division of Waters is the successor of the Drainage Commission established in 1897.

BOAT AND WATER SAFETY - The Bureau of Boat and Water Safety was created for the purpose of administering the Minnesota Boating Act passed April 26, 1959. The Director of this Bureau, who is directly responsible to the Commissioner, is charged with the responsibility of watercraft registrations; maintaining liaison with the county auditors on boat registrations; cooperating with the county sheriffs in the enforcement of the Minnesota Boat and Water Safety Laws; promoting safety of persons and property in connection with the use of waters in the state; promotes uniformity of laws relating to such use; and has responsibility for the administration of the Minnesota Boat and Water Safety Laws in cooperation with other states, and federal agencies.

BUREAU OF BUSINESS MANAGEMENT - The Bureau of Business Management, 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, budget control, internal audits, game and fish license sales and accounting, all other licenses and permits; Personnel, which is responsible for Personnel policies, personnel training, labor relations, personnel records and preparation of payrolls; and Plant and Equipment, which is responsible for maintaining a system of inspection and operation costs of all motorized equipment in the department, maintain records on department-wide inventory system, department office supplies, and mail and messenger service systems.

At the time of adoption of "Machine Data Processing" with I.B.M. equipment in 1954, a system of "Cost" Accounting was also included in the new accounting system. Within a short period of time this Cost Accounting system proved so worthwhile that it has become an integral segment of the accounting procedures now in operation with the Conservation Department.

It has eliminated to a great extent the tedious detailed "record keeping" on analysis sheets by numerous Department personnel. It has provided an accurate breakdown of expenditures which is necessary in the administration of Federal funds. It has provided a priceless "historical" record of expenditures which is so vital to sound fiscal planning. And having all these records on punched cards has provided a system for analyzing detailed records that would formerly have been too voluminous or costly to process using the antiquated "manual" system of record keeping.

COMPREHENSIVE PLANNING - The Bureau of Comprehensive Planning assists the Commissioner's office in long range comprehensive planning for the department. The work involves close coordination with the Commissioner's office and each division for the purpose of assuring that future plans are compatible with departmental goals. The Bureau also works closely with the Minnesota Outdoor Recreation Resource Commission and other planning agencies of the federal, state, county, and city governments. The objective of this Bureau is to integrate planning activities for the department in a manner that will further the best conservation of our natural resources and promote a balanced state outdoor recreation program of outstanding value.

ENGINEERING - It is the Bureau of Engineering's responsibility to process all surveys in connection with property and projects, including the design and supervision of construction projects sponsored by the various divisions of the Conservation Department.

The Bureau of Engineering received 630 requisitions for Engineering services from July 1, 1962 through June 30, 1964. Of these requests and including those received prior to the above period, 463 were completed. On June 30, 1964, 356 requisitions for Engineering services remained to be processed. Plans and specifications for contract were prepared for 105 projects involving an expenditure of $583,988 during this period. At the end of the two-year period, 118 projects were in progress of construction, for which the Bureau of Engineering prepared plans and supplied field supervision. Total value of the work on Conservation Department construction projects for the aforementioned period was $1,629,706.

The Bureau's field crews made 456 surveys; mostly property surveys of individual tracts for the various divisions in the process of their land acquisition programs for park lands, wetlands, and public accesses.

Engineering and construction was completed on two lake and channel improvements; 16 spawning areas and rearing ponds; 20 hydraulic control structures including dams, fish barriers and traps; 77 buildings; and 111 bridges, roads, water and sewer systems; as well as many other projects processed by the Bureau.

The appraisal of other various services rendered by the Bureau of Engineering to the divisions of the Conservation Department, while difficult to assess, have proved to be exceedingly important to the department's operation. These include the drafting of charts and diagrams; feasibility studies for special projects; and assistance rendered in public hearings, court cases and land negotiations.

INFORMATION - The Bureau of Information, established in 1941, is charged with the responsibility of carrying out the Department's public relations and public information program. The Bureau consists of a director and a staff of ten professionally trained and clerical employees -- the same complement it had 23 years ago. This unit publishes The Conservation Volunteer, nationally acclaimed magazine with a circulation of 38,500 and a waiting list averaging 1,500. The Bureau also publishes a weekly newsletter distributed to more than 500 newspapers, special news releases and feature stories, and informational pamphlets and brochures on a variety of conservation subjects. The Bureau's weekly radio program for schools and other listeners, now in its 17th year, is produced in cooperation with the University of Minnesota's School of the Air and has added materially to the more than 125 sound-tape programs now available to schools. The Bureau, with a staff member serving as committee chairman, has cooperated with the Department of Education in development of curriculum for elementary grades. The Bureau of Information carries on a continued program of cooperation with youth groups, elementary and high schools, and college classes through development of materials and instruction, and participation in conservation forums. The Bureau's film loan library (58 different subjects -- 70 films in color) is booked solidly throughout the year by requests from schools, colleges, sportsmen's groups and civic and church organizations. Conservation literature mailed on request averages more than 1,700 per month, in addition to thousands of requests via office visits during the year. Other activities include the annual Arbor Day tree planting program, a program of outdoor safety through the Minnesota Safety Council, and a variety of special projects, reports, photography services, and a broad program involving writing and research.

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 staff are paid and furnished office space by the department, although members are under the supervision of the State Attorney General's Office.

## Natural Resources Act

The Minnesota Omnibus Natural Resources and Recreation Act of 1963 is considered by many to be the greatest step forward in conservation history since establishment of the Department of Conservation in 1931. Signed into law by Governor Rolvaag May 20, 1963, this initial segment of a long-range program to assure present and future generations adequate and diversified recreational facilities, was activated by the Department of Conservation just two months later -- July 19.

The Department's combined explanatory and fiscal statement outlining the specific proposals and programs for activating the Natural Resources Act was presented to the Minnesota Outdoor Recreation and Resources Commission on that date and met with immediate and wholehearted approval of members of the Commission.

Since that time, this ambitious program has been on target and on time. Financed by an additional penny-per-pack tax on cigarettes, Natural Resource Act programs already have provided Minnesota with urgently needed state parks lands, historic sites, wildlife areas, access to and improvement of lakes, rivers, streams, scenic areas, fish spawning areas, and camp grounds.

The Natural Resources Act has provided funds for urgently needed state park development -- improvement to state park roads, parking areas and trails, tourist camp ground development and expansion, roads and spurs, water and sanitary systems, boat launching facilities, waterfront and beach improvement, new camp grounds, and building construction.

It has expanded our reforestation efforts; our tree nursery programs; and provided forest roads and forest camp grounds. It has revitalized and expanded our essential planning, basic topographic mapping, hydrologic studies, and both ground and surface water research necessary for recreational and conservation purposes.

The Natural Resources Act also had an impact on the economy of distressed areas, providing gainful employment on conservation projects to unemployed workers in these areas.

# MINNESOTA CONSERVATION DEPARTMENT
## BUREAU OF ENGINEERING

## ENGINEERING SERVICES RECAPITULATION
July 1, 1962 thru June 30, 1964

| | CONSERVATION (ADMIN., INF. ETC.) | FORESTRY | WATERS | PARKS | WARDENS SERVICE | GAME STATE | GAME FED. AID | FISHERIES STATE | FISHERIES FED. AID | G & F SUB-TOTAL | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| REQUISITIONS IN PROGRESS June 30, 1962 | 0 | 4 | 8 | 49 | 10 | 5 | 59 | 47 | 7 | 128 | 189 |
| REQUISITIONS RECEIVED July 1, 1962 thru June 30, 1964 | 1 | 31 | 4 | 283 | 144 | 9 | 105 | 53 | 0 | 311 | 630 |
| REQUISITIONS IN PROGRESS June 30, 1964 | 0 | 8 | 5 | 137 | 57 | 9 | 71 | 67 | 2 | 206 | 356 |
| REQUISITIONS COMPLETED July 1, 1962 thru June 30, 1964 | 1 | 27 | 7 | 195 | 97 | 5 | 93 | 33 | 5 | 233 | 463 |

DISTRIBUTION OF REQUISITIONS COMPLETED
From July 1, 1962 thru June 30, 1964

REQUISITIONS FOR ENGINEERING SERVICES DISTRIBUTED AS TO CLASS AND TYPE

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LAKE & CHANNEL IMPROVEMENTS | | | | | | | | 2 | | 2 | 2 |
| SPAWNING AREAS, REARING PONDS | | | | | | | | 11 | 5 | 16 | 16 |
| PUBLIC ACCESSES (ACQ. & DEVELOPMENT) | | | | | 93 | | | 7 | | 100 | 100 |
| CONTROL STRUCTURES, DAMS, FISH BARRIERS, TRAPS, ETC. | | | 6 | | | | 4 | 10 | | 14 | 20 |
| WILDLIFE MANAGEMENT AREA (ACQUISITION ONLY) | | | | | | | 86 | | | 86 | 86 |
| BUILDINGS | | 7 | | 66 | 1 | 2 | | 1 | | 4 | 77 |
| MAPS, CHARTS, DIAGRAMS ETC. | 1 | 9 | 1 | 38 | | | | 2 | | 2 | 51 |
| MISC. PROJECTS - BRIDGES, ROADS, WATER & SEWAGE SYSTEMS ETC. | | 11 | | 91 | 3 | 3 | 3 | | | 9 | 111 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SURVEYS MADE (PROP. - TOPOG - MISC.) | 0-0-2 | 7-0-18 | 0-0-0 | 9-6-38 | 102-12-3 | 7-6-5- | 155-5-6 | 18-36-13 | 6-1-1 | 288-60-28 | 304-66-86 |
| HARDSHELLS PREPARED | | | | 7 | 52 | | 5 | 34 | 3 | 94 | 101 |
| DRAWINGS PREPARED | 67 | 149 | 7 | 391 | 88 | 58 | 259 | 61 | 11 | 477 | 1091 |
| ENGINEERING REPORTS SUBMITTED | 3 | | | 6 | | | 4 | | | 4 | 13 |
| COST ESTIMATES PREPARED | 1 | 35 | 5 | 128 | 13 | 10 | 2 | 17 | 4 | 46 | 215 |
| PROJECTS SUBMITTED FOR CONTRACT | 1 | 28 | 2 | 57 | 1 | 3 | | 11 | 2 | 17 | 105 |
| PROJECTS UNDER CONSTRUCTION 6-30-64 | | 16 | 1 | 92 | | 1 | | 7 | 1 | 9 | 118 |
| VALUE OF WORK PAID ON CONTRACT | | 264,498 | 3689 | 217, 996 | 2710 | 51,234 | | 36,211 | 2650 | 92,805 | 583,988 |
| VALUE OF WORK PAID ON FORCE ACCOUNT | | 98,051 | | 235,327 | 462 | 45,801 | | 17,237 | | 63,500 | 456,878 |
| VALUE OF WORK PAID ON CONSERVATION WORKS PROJECTS | | 186,737** 13,298 | | 119,399 | 5560 | | 230,143 | 33,703 | | 269,406 | 588,840 |
| TOTAL PAID ON CONSTRUCTION PROJECTS* | | 562,584 | 8689 | 622,722 | 8732 | 97,035 | 230,143 | 87,151 | 2650 | 425,711 | 1,629,706 |

*PROJECTS FOR WHICH SURVEYS, PLANS AND CONSTRUCTION SUPERVISION WAS FURNISHED BY BUREAU OF ENGINEERING
** FEDERAL AID

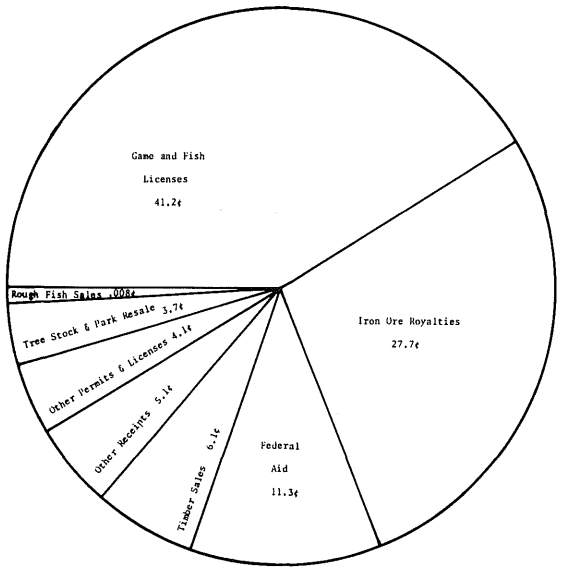
7 X 11

SHEET 1 OF 1 | FILE C-23

# F I N A N C I A L  S T A T E M E N T

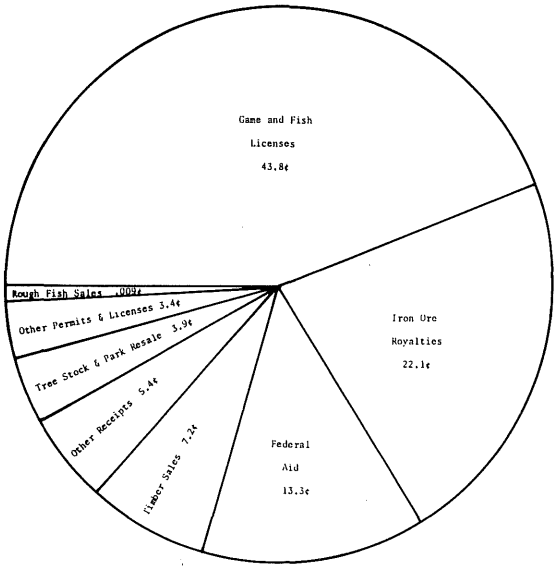
## WHERE YOUR CONSERVATION DOLLAR COMES FROM

### RECEIPTS 1962




| INCOME BY DIVISION | |
|---|---|
| Administration | $ 140,271 |
| Waters | 13,780 |
| Forestry | 1,402,184 |
| Lands & Minerals | 3,316,394 |
| Game & Fish | 5,545,780 |
| Parks | 594,114 |
| Total | $11,012,523 |

### RECEIPTS 1963

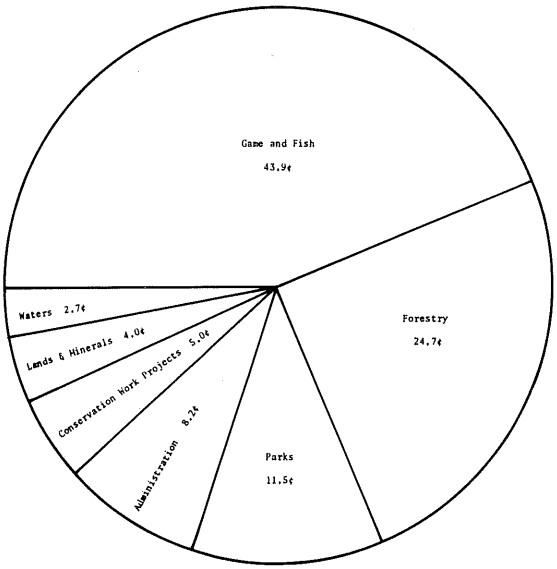



| INCOME BY DIVISION | |
|---|---|
| Administration | $ 136,350 |
| Waters | 21,096 |
| Forestry | 1,771,969 |
| Lands & Minerals | 2,645,526 |
| Game & Fish | 5,702,481 |
| Parks | 542,933 |
| Total | $10,820,355 |

# DEPARTMENT OF CONSERVATION

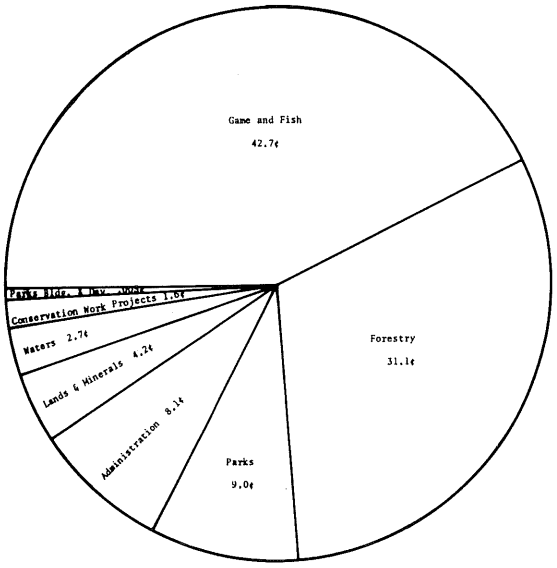
## WHERE YOUR CONSERVATION DOLLAR IS SPENT

### EXPENDITURES 1962




| EXPENDITURES BY DIVISION | |
|---|---|
| Administration | |
| Operational Services | $ 316,213 |
| Engineering | 178,699 |
| Legal Bureau | 76,521 |
| Information Bureau | 89,329 |
| Boat & Water Safety | 259,458 |
| Other | 250 |
| Total Administration | $ 920,470 |
| Waters | 300,094 |
| Forestry | 2,769,838 |
| Lands & Minerals | 437,378 |
| Game & Fish | 4,921,492 |
| Parks | 1,293,123 |
| Conservation Work Projects | 576,210 |
| Total | $11,218,605 |

### EXPENDITURES 1963

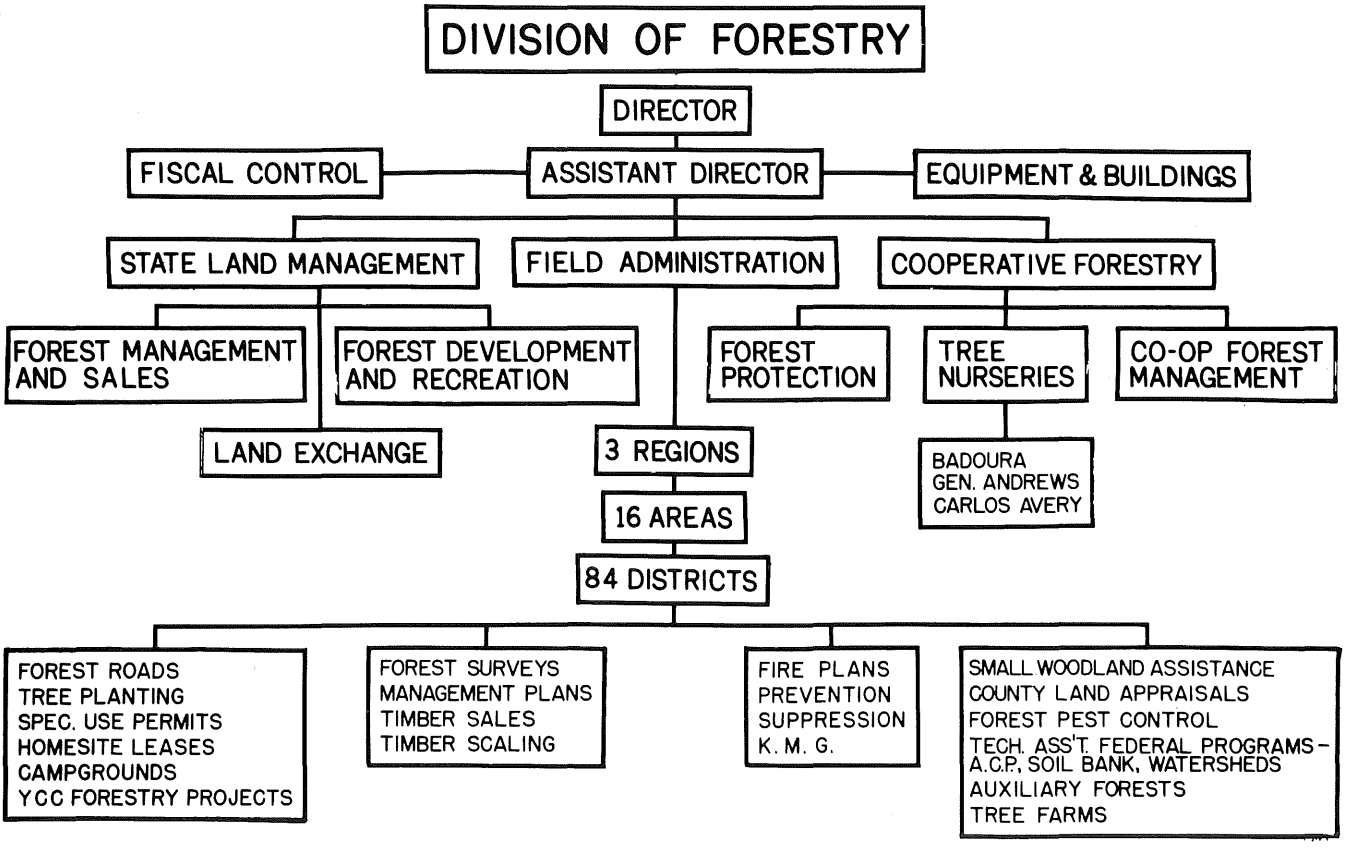



| EXPENDITURES BY DIVISION | |
|---|---|
| Administration | |
| Operational Services | $ 300,346 |
| Engineering | 177,514 |
| Legal Bureau | 77,650 |
| Information Bureau | 86,467 |
| Boat & Water Safety | 257,920 |
| Other | |
| Total Administration | $ 899,897 |
| Waters | 293,847 |
| Forestry | 3,442,390 |
| Lands & Minerals | 459,876 |
| Game & Fish | 4,720,991 |
| Parks | 992,702 |
| Conservation Work Projects | 178,716 |
| Parks Building & Development | 64,024 |
| Work Projects Natural Resources | 10,338 |
| Total | $11,062,781 |

# *Forestry*

The Minnesota Division of Forestry gives intensive management to 2,919,215 acres of state-owned land most of which is included in 54 state forests. In addition, the division administers the timber sales program on approximately 2,100,000 acres under the jurisdiction of other divisions of the Conservation Department or other state agencies such as the University of Minnesota, and the Minnesota Highway Department. Above average accomplishments have been made during the past biennium in the reforestation of state forest lands, improvement and development of state forest recreation areas and the completion of district forest management plans. As in previous years, close contact has been maintained with other land management and research agencies in order to evaluate new techniques for application on state lands.

The Division of Forestry had to provide service on its many programs without benefit of an increase in its complement over the previous biennium. The total complement consisted of 273 permanent personnel, 19 intermittent employees and 63 seasonal forest guard positions. In addition some 2,000 temporary laborers and fire fighters were needed on various projects of the



division such as fire suppression, tree planting, nursery operation, roads and trails construction, and maintenance, buildings and campground construction.

## State Land Timber Sales

Fiscal Years 1963 and 1964, like the two before them, were plagued by below normal market demand for pulpwood and most other forest products. While the most valuable products from pine and spruce were close to the allowable cut, in total of all species, we harvested but a third of the desirable cut. Increased state revenue is but one of several reasons for harvesting additional timber. Proper timber harvesting prevents timber waste, provides additional employment, and provides for the regeneration of new forest crops.

There is evidence that in the foreseeable future we will need all the timber we can grow. The supply at that time will be greater and better because of good harvesting now. Every effort is being made to increase our annual cut where surpluses exist.

## Forest Management Planning

From the total state land ownership of 5,011,764 acres (not including State Park lands), intensive district forest survey has been accomplished on 2,085,000 acres. This amounts to approximately 41 per cent of the total state lands.

These lands are now under intensive management to provide a sound basis for timber sales and forest development planning.

Of the 84 districts within the state, a total of 39 district management plans have been published and 6 district management plans are in rough draft ready for publication. These intensive district management plans account for approximately 54 per cent of the forester districts within the state.

## Land Exchange

The land exhange program is designed to consolidate state lands in state forests, state parks, wildlife areas or other conservation areas and at the same time consolidate other public and private land for more efficient management. The Division of Forestry acts for the Commissioner of Conservation in investigating land exchange proposals, and recommending action to the Land Exchange Commission concerning such proposals.

During the past biennium, land exchange applications and completions have shown a significant increase. 32 land exchanges were completed this

biennium compared to 24 completed the previous biennium. A total of 15,842.45 acres were added to state forests, state wildlife areas, state parks or county management units through land exchanges during this biennium. In addition, the U. S. Bureau of Sport Fisheries and Wildlife Service was authorized to purchase 11,563.54 acres and lease 13,696.02 additional acres for wildlife production purposes by the Land Exchange Commission.

## Planting Program

During the biennium, the Division of Forestry planted over 20 million seedlings on 19,538 acres. Though there was a substantial increase over the previous biennium in number of trees planted (from 16.3 million to 20.3 million), there was an even greater increase in the acreage planted. Research has determined that adequate stocking and better growth can be secured with lighter plantings. The increased planting program was possible in part, because of natural resource monies made available and also because of federal aid.

## Cooperative Forest Management

This service, provided by the Division of Forestry, is concerned with private owners of holdings of less than 1,000 acres of forest land. In Minnesota there are approximately 7,000,000 acres of land owned by 150,000 individuals, and upon this land a good share of forestry depends.

There is need for some forest management on most of this private land now idle or producing less than it is capable of doing. The Division will strive to improve and maintain the productivity of these lands, thereby increasing the income and improving the owners' welfare. There will be productive forests forever if they are properly managed.

Division of Forestry personnel furnish "on the ground" forestry advice and assistance to private owners. The owners' needs and desires are coordinated with all the multiple use potentials of their woodlands. Multiple use planning considers timber production, recreation, wildlife, special products such as maple syrup, herbs, water, forage and other forest crops.

## State Tree Nurseries

The Division of Forestry maintains and operates three nurseries for the production of tree planting stock. Seedling stock is sold at the cost of production to the citizen of the State for reforestation of their lands, establishment of windbreaks, shelterbelts, and for erosion control and woodlots. Public agencies and local governmental sub-divisions obtain trees free of charge for planting on public lands. The Division of Forestry is the largest single user of the nurseries output. The annual requirements of the Division usually amounts to 1/4 to 1/3 of the total production. These trees are used for reforestation of State Lands in State Forests.

## Forest Insects and Disease Control

In the past fire has been the greatest enemy of the forest. Now through effective fire prevention and protection these losses have been drastically reduced. Insects and disease are now the No. 1 killers of our trees and destroyers of forest products. It has been estimated that these pests destroy 1,000,000 cords of Minnesota timber annually. The pine tussock moth has been contained after virtually destroying 1,000 acres of jack pine near Willow River. It posed a threat to adjacent areas and one unrelated infestation near Brainerd.

## Auxiliary, School and Municipal Forests

The Auxiliary forest law was designed to encourage good forestry practices on private lands through an equitable form of taxation accompanied by enforcement of proper forest practices. Obsolete clauses and numerous amendments have made the administration of this law by the Division both cumbersome and costly. To date there are approximately 260,000 acres of private land under the Auxiliary forest law. The Minnesota and Ontario Paper Company is the principal contract holder. There are 59 contracts now in effect, located within 10 counties. The taxes paid during the biennium totaled $100,136.26.

Three new school forests were activated during the biennium, increasing the total number to 32 in Minnesota. They are the Frazee, Cass Lake, and McGrath school forests. One municipal forest, at Deer River, has been certified during this period. There are now seven municipal forests in Minnesota that have been approved by the Commissioner of Conservation. These forests illustrate approved woodland management and demonstrate good forestry practice to students and others. Personnel engage in forest management and educational activities.

## Tax-Forfeited Lands

Division personnel are responsible for the approval of timber appraisals and the forestry practices to be followed in the cutting of timber on tax-forfeited lands.

During the biennium Division personnel appraised the timber on 305,000 acres of land proposed to be offered for sale by the counties. The purchase of tax-forfeited land and timber will probably accelerate for there is considerable interest in the purchase of large blocks by development and other groups and individuals.

There are about 1,000,000 acres of county tax-forfeited lands in memorial forests. These forests are set aside by county board resolution and must

be more suited for forestry purposes than other uses. Monies received from forests so dedicated may be expended for development and maintenance.

## Forest Roads and Trails

The Division of Forestry completed construction on 40 miles of new forest roads at a cost of $97,336. Another 15 miles of new construction that will cost $59,046 is still under contract and is about 75 per cent completed. This brings the forestry mileage to 1,315 miles. Sixty-four (64) miles of existing forest roads were improved by reconstruction to all-weather or higher standard by an expenditure of $69,027.

Special labor projects were set up under C.W.P., A.P.W., and N.R. funds during these fiscal periods, which provided employment in eleven of the distressed counties. These work crews cleared and burned 20 miles of new right of way, and did a varied degree of maintenance on 569 miles of forest roads, primarily hauling gravel, roadside brushing, and culvert replacement.

## State Forest Administration

The past biennium has seen a great deal of activity and change in Minnesota's state forests. The 1963 Legislature extensively revised the state forest boundaries, following the recommendations of the Division of Forestry. This was done to obtain a higher percentage of state-owned land within the forest boundaries. By concentrating state land ownership, more intensive forest management practices can be accomplished on these lands.

There are now 54 named state forests with a total state-owned acreage of 2,883,582. In addition, there are 1,814 acres of scattered state-owned lands consisting largely of administrative sites which have state forest status but are outside the boundaries of the named state forests. There also are 33,819 acres of county tax-forfeited lands accepted by the Commissioner of Conservation for forestry purposes which will be recommended for inclusion within state forest at the 1965 Legislative session. There will then be a grand total of 2,919,215 acres of state-owned lands with state forest status.

Perhaps the greatest amount of activity and growth has taken place on the Minnesota Memorial Hardwood State Forest. The 1963 Legislature appropriated $150,000 for each of the two years of the biennium for land acquisition within this forest. As a result, state-owned lands within the boundary of the Minnesota Memorial Hardwood State Forest totaled 5,432 acres as of June 30, 1964, most of which was acquired through purchase. As of November 1, 1964, an additional 3,786 acres have been optioned for purchase. This forest, extending along the Mississippi River from Hastings to the Iowa border, will continue to generate a great deal of interest because of its recreational and timber-producing possibilities, and superb scenery.

## Forest Recreation and Campgrounds

Outdoor recreation has been an important phase of the multiple-use program on state forests and will be of even greater significance in the future. In an effort to keep pace with the rising demand for recreational facilities, the Division of Forestry has established three new campgrounds (Blueberry Hill, Larson Lake, and Lougee Lake), bringing the total of such facilities to 23. Nearly all other campgrounds have been enlarged and additional facilities provided.

Work is now progressing on four additional new campgrounds (Birch Lake, Hay Lake, Mantrap Lake, and Willow River) which will be ready for the 1965 camping season. Twenty-four additional campgrounds are planned within state forests for the next ten-year period. As in the past, Division of Forestry campgrounds will continue to be of the primitive type, providing only sufficient facilities to insure adequate sanitation measures and prevent the spread of fires.

## Marketing and Utilization Program

Statistics show that Minnesota's forest lands are growing wood at a much greater rate than the annual rate of removal. Surpluses of certain species, such as aspen, miscellaneous hardwoods, tamarack, and balsam, are rapidly building to a point where we can expect considerable loss unless suitable markets can be found. An expanded program to utilize more Minnesota grown wood has been launched. A marketing specialist has been added to the director's staff.

A complete canvass of Minnesota's wood using industry is being conducted. With this information, we will be in a better position to assist the primary and secondary wood using industry market, their products and obtain their wood needs. Such service will in turn enable us to promote the use of more surplus wood, and provide basic information on which to improve the forest products based economy of the state.

Through exhibits, contacts, and the distribution of educational and technical material, efforts have been made to improve the products of our small producers so that they will be better able to compete in the market place. With the state extension foresters, we are publishing a forest products bulletin as an aid in bringing the buyers and sellers of forest products together. Future plans involve the further expansion of activities started during this period.

## Watershed Programs

The State Division of Forestry participates in watershed program activities under Public Law 46 and Public Law 566 through a cooperative agreement

with the U. S. Forest Service. Much of the planning and survey work is done by the local Private Forest Management Service forester with assistance from the U. S. Forest Service. Approved watersheds are carried in the Division of Forestry work programs and assigned to the district to which it pertains.

Forest work under watershed protection consists of: Protection of forest lands from grazing; Protection of Forest lands from fire, insects and disease; Providing technical assistance in the improvement and management of existing woodlands; Reforestation of badly eroded areas which are now critical sources of sedimentation and rapid run-off of water; and Reforestation of those areas where best land use indicate a conversion from an agricultural to a forest land use.

During fiscal year 1964 district foresters from the State Division of Forestry worked on two approved P. L. 566 watersheds in the Memorial Hardwood Forest: Bear Valley, Wabasha and Goodhue counties; and Crooked Creek in Houston county. Forty-five watershed projects in 50 counties are listed for action, in various stages from planning and investigation to completed activities. The Division of Forestry will be participating under a P.L. 566 cooperative agreement with the U. S. Forest Service in watershed activities on three approved watersheds. In addition, the Division will be engaged in planning and investigation work on nine other watersheds.

## Forest Fire Control

For the biennium ended June, 1964, more than 550 fires burned a total of about 10,800 acres. Extent of the average fire was less than 20 acres, with the average timbered area burned per fire about four acres.

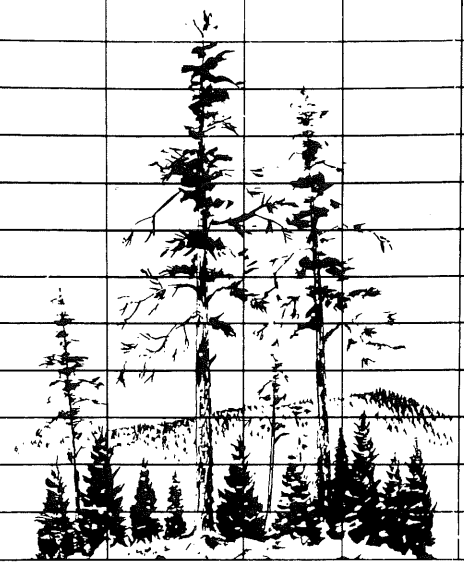
The total annual burn of forested acres during the biennium was less than 3,400, or one-fourth of the annual total experienced in the previous 20-year period.

In 1963 the normal number of fires (682) occurred--three below the 20-year average. Burned acreage, at 26,361 was less than half the 20-year average of 54,489. The total of forested land (as opposed to grasslands) burned in 1963 was again reduced below previous years and averages. In 1963 forested areas burned in the average fire was four acres, compared to 7.1 acres in 1962 and 14.5 as a 20-year average.

For 1954, with the previous winter one of much below normal snowfall, there were early fires--17 in February and March burning more than 500 acres. During the months of April, May, and June, 537 fires burned an estimated 10,000 acres. Above normal temperatures during April contributed to the 299 fires which burned about 7,100 acres during that month.

# ESTIMATED VALUE OF FOREST PRODUCTS HARVESTED IN MINNESOTA 1963

| 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 | 1,063,254 Cords | 235,031 | 4,935,651 | 828,223 | 1,140,168 | 180.15 | 205,401,265 | 210,336,916 |
| 2 LUMBER | 201,000,000 Bd. Ft. | | | | | 92.00 | 18,492,000 | 18,492,000 |
| 3 FUELWOOD | 550,000 Cords | | | | | 12.00 | 6,600,000 | 6,600,000 |
| 4 CHRISTMAS TREES WREATHS ETC. | 5,250,000 Pieces | | | | | 1.10 | 5,725,000 | 5,725,000 |
| 5 MATCHWOOD COOPERAGE ETC. | 27,400 Cords | | | | | 185.60 | 5,085,440 | 5,085,440 |
| 6 POSTS | 5,681,000 Pieces | | | | | .60 | 3,408,600 | 3,408,600 |
| 7 SHAVINGS, SAWDUST NOVELTIES. STAKES. ETC. | —— | | | | | — | 2,100,000 | 2,100,000 |
| 8 CHEMICAL BY-PRODUCTS and MILL REFUSE (FUEL) | —— | | | | | — | 1,477,319 | 1,477,319 |
| 9 VENEER WOOD | 9,970,000 Bd. Ft. | | | | | 110.50 | 1,101,685 | 1,101,685 |
| 10 POLES | 190,670 Pieces | | | | | 4.75 | 905,682 | 905,682 |
| 11 RAILROAD TIES | 136,000 Pieces | | | | | 2.15 | 292,400 | 292,400 |
| 12 PILING | 241,500 Lin. Ft. | | | | | 1.00 | 241,500 | 241,500 |
| 13 MINING TIMBER | 2,330,000 Bd. Ft. | | | | | 60.00 | 139,800 | 139,800 |



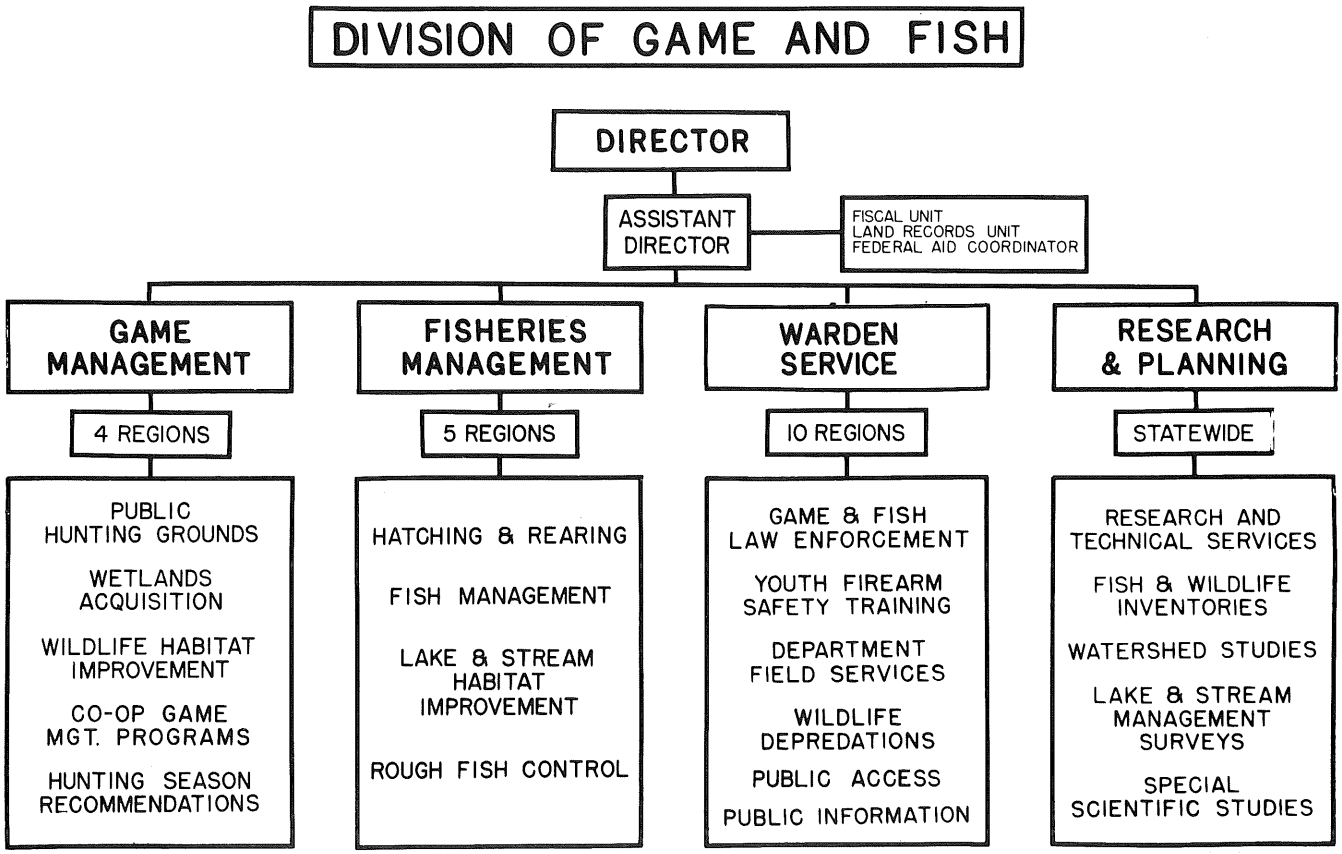
**TOTAL . . . $255,956,357**

OTHER FOREST PRODUCTS – WILD BERRIES, NUTS, FRUITS, MAPLE SYRUP, CONES, ETC. ESTIMATED VALUE $1,500,000

# Game and Fish

The 1963-64 biennium has been a period of accomplishment in the management and development of Minnesota's game and fish resources. Funds available through the Natural Resources Act, the Conservation Works Program and various federal aid programs allowed the fulfillment of many projects planned in previous years. All of this reflects the interest and demand of our people in maintaining hunting and fishing as a primary recreational and economic resource. Some of the major accomplishments made are outlined in subsequent section of this report.

It is satisfying to review accomplishments, but it is exciting to view the future and the possibilities it presents. Continuation of the Natural Resources Program along with new and far-reaching federal aid programs prepares the way for the most significant accomplishments in game and fish resource development in our generation. Under these programs we can expect more physical improvements to wildlife habitat during the next 10 years than has been possible in all of the past.



However, these improvements will not take place without sound planning and supervision. The backlog of development plans has been exhausted. New plans must be studied and developed, requiring trained personnel. Adequate supervision must attend the actual development once the plans have been formulated.

To meet this challenge and take advantage of the tremendous opportunities available will require some "beefing-up" of the Game and Fish Division. However, sportsmen have always been willing to pay for sound wildlife programs and are sure to come forth now to assure maximum accomplishments during this period of opportunity.

Although proud of the accomplishments outlined below, the Game and Fish Division is anxious to proceed with the work ahead.

## Section of Game

"What we have now is largely a matter of chance; but what we are to have cannot be left to chance". These words were written by Durward Allen in his book, Our Wildlife Legacy. While intended for a generally broad application to wildlife habitat and populations in the United States, they are suitable for specific application to the wildlife resources in Minnesota. The Section of Game is charged with the responsibility of managing the state's wildlife resources. Programs are formulated so as to maintain, restore and manage wildlife resources on public hunting grounds throughout the state and to work with related agencies in efforts to manage wildlife habitat on private lands. As in the preceding bienniums the most important activity of the Section continues to be acquisition of wetlands under the "Save Minnesota's Wetlands" program - as shown in Table I.

TABLE I

| Date | No. of Counties | No. of Units | No. of Options | No. of Acres Optioned & Acquired | Cost |
|---|---|---|---|---|---|
| 1962-64 | 73 | 132 | 254 | 23,189.47 | $1,163,257.50 |
| Prior to 1962 | 73 | 501 | 1,041 | 108,494.67 | 3,190,526.68 |
| | | 633 | 1,295 | 131,684.14 | $4,353,784.18 |

To attain our initial goal of 250,000 acres of wetlands will require the acquisition of 15,000 acres annually for the next eight-year period. Wetland areas acquired and developed since 1951 are receiving increasing use by the public. This is especially true in the southern and western parts of the state where much of the land is posted to hunting and where

much of the cover has been eliminated. In addition to the aforementioned acreage, 4,279.45 acres of wildlife land comprising 58 tracts were acquired, in ten major units, at a cost of $233,383.20.

The programs and accomplishments of the present biennium include:

1. A total of 23,189 acres of wildlife wetlands comprising 132 tracts were optioned and acquired during this biennium at a cost of $1,163,257.50. Another 4,279.45 acres of wildlife land comprising 58 tracts were acquired for a total of 27,468.45 acres at a cost of $1,396,640.70 for the biennium.

2. More than 130 new wildlife management areas were acquired and put under management during the biennium with another 100 planned for future acquisition. The Section of Game now has active wildlife management projects located in 76 counties of the state.

3. About 850,000 acres of state wildlife lands were managed specifically for wildlife and public hunting. The management phase on these lands included 935,000 yards of fencing, brushing and posting; the planting of 246,000 trees and shrubs for wildlife food and cover on both state and private lands, and the construction of 15 waterfowl impoundments totaling 10,000 acres.

4. A 1,000 acre waterfowl impoundment was constructed on the Sunrise River project in Chisago county, 35 miles north of the Twin Cities. A second pool nearing completion within the same project will provide an additional 1,500 acres of waterfowl habitat and public hunting. The completion of these two control structures and the flooding of 2,500 acres of land represents the fulfillment of a 15 year program of planning, acquisition and construction. Although the dam itself was built by contract, much of the work required for the completion of this structure was carried out by Game personnel assigned to the Carlos Avery Wildlife Management Area.

5. Construction was also completed on a 1,800 acre waterfowl impoundment on the 6,000 acre Morph Meadow Wildlife Management Area in Itasca county. Work on the Morph Meadow Unit consisted of the construction of three miles of earth dike with a control structure to maintain water levels at the most optimum level for waterfowl. Continued development and management can add significantly to the hunting opportunities in Itasca county.

6. Captive goose flocks have been established at the Thief Lake, Lac qui Parle and Roseau Wildlife Management Units. The eggs were hatched and young raised at the Carlos Avery Game Farm. In September the young goslings were transferred to one of these three state units. After three years they will be released as free flyers. As a result of this program and the improvement of goose feeding and resting areas, sportsmen of Minnesota harvested approximately 300 geese during the 1963 season at Thief Lake. Good goose hunting was also experienced at the Roseau and Lac qui Parle wildlife management areas.

7. The Carlos Avery Game Farm raised and released to cooperative sportsmen's clubs, 83,496 day-old pheasants throughout the major pheasant range. Two thousand mallards were also raised and released on the state-owned wetlands units.

8. Forty-five Conservation Works Projects were carried out by the Section of Game during the biennium at a cost of $192,000. These projects included the impoundment of waterfowl habitat, seeding of trails, and the construction of about 100 miles of forest-game hunter access roads and trails in the northern counties of the state.

These roads and trails provide access to harvest game species, for logging operations to remove state timber, control of fire, and access for game management and development activities in previously inaccessible areas.

9. To alleviate the waterfowl depredations problem in northwestern Minnesota, Game personnel on the Roseau and Thief Lake wildlife management areas, in cooperation with the U. S. Bureau of Sport Fisheries & Wildlife, fed about 15,000 bushels of grain, which was obtained from the Commodity Credit Corporation, to keep waterfowl on the areas and out of fields. Personnel from the Game and Law Enforcement Sections and the U. S. Bureau of Sport Fisheries & Wildlife also cooperated with private landowners to help keep waterfowl out of grain fields prior to the harvest.

10. Personnel of this Section have carried out cooperative planning work with the following federal agencies: U. S. Army Corps of Engineers, U. S. Bureau of Sport Fisheries & Wildlife, U. S. Forest Service and the Agricultural Stabilization and Conservation Service. In the course of the planning, 48 small watersheds (Federal-Public Law 566) were evaluated and recommendations made which would prove beneficial to wildlife.. This work is requiring more and more time of Game Section employees.

Cooperative planning also was carried out with state and county agencies including the State Department of Agriculture, State Highway Department, counties, University of Minnesota and others.

11. Ground surveys and hunter bag checks were made on deer, waterfowl, pheasants and grouse. Also, aerial surveys were made during the past biennium on moose, elk, deer and beaver. The results of these censuses are used in management and setting of trapping and hunting seasons. Aerial surveys in 1964 indicated a moose population of about 8,000 animals and an elk herd of 26.

## Future Plans

The "Save Minnesota's Wetlands" program needs continued emphasis backed by sufficient funds for accelerated acquisition. Another 120,000 acres must be acquired to reach the initial goal of 250,000 acres. With

no sign of abatement in the rapid rate of drainage of surface waters, this must be accomplished within the next eight years, while wetlands are still available for acquisition by the state. Conservationists agree that additional funds are urgently needed for wetlands acquisition. It is also planned to continue the approved land acquisition program on the major wildlife management units at the current rate, or faster if funds are available. Additional area game managers are urgently needed to efficiently carry out Section of Game programs and to provide proper service to hunters. The Section of Game will continue to handle at the local level as many as possible local wildlife management and public relations problems. Multiple use of wildlife management areas will be stressed wherever this is compatible with primary project objectives.

## Section of Fisheries

The Section of Fisheries has the responsibility of carrying out a state-wide fish management program, in accordance with law, Department policies, regulations, 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 and rearing areas; operation of hatcheries and rearing ponds for the propagation and distribution of fish; rescue and transfer of fish from lakes wherein they are subject to winterkill; rough fish control; lake reclamation through the use of fish toxicants; administration of licensed commercial fishing and private fish hatcheries; and formulation of regulations governing the harvest of fish (sport and commercial).

Lake improvement projects during the biennium totaled 29 and included three water-control dams; two water-and-rough-fish-control dams; three barriers at outlets of reclaimed lakes; nine channel improvement projects; one debris deflector; and 11 northern pike spawning areas. In addition, there were 12 major maintenance projects on ponds, dikes, and water supply lines. Improvements were made on 16 trout streams and three special traps were constructed on North Shore streams for the assessment of the Lake Superior steelhead run. Maintenance work was done on 19 trout streams.

A service building was constructed at the French River Area Fisheries Headquarters under the Conservation Work Program. A temporary office was constructed at the County Fairgrounds in Hutchinson for a Regional Fisheries Office Headquarters.

Twelve lakes were reclaimed by the use of chemicals; eight were trout lakes with a total area of 235.44 acres and four were warm-water fish lakes with a total area of 965.6 acres. Twelve northern pike spawning areas with a total area of 279.21 acres were purchased. Fifty-five options were taken on 31 additional areas totaling 1,093.41 acres.

The management of northern pike spawning areas, tributary or adjacent to lakes, is very important in the maintenance of this species. This involves the installation of water-level-control structures and channel improvement, and, in some cases, pumping units.

Northern Pike Spawning Areas Managed

| | 1962 | | 1963 | |
|---|---|---|---|---|
| | Number | Acreage | Number | Acreage |
| State-owned | 38 | 2,150 | 41 | 2,260 |
| Cooperative | 100 | 700 | 70 | 225 |

Fish Rescue Operations

The following amounts were rescued and stocked:

| Year | Number | Pounds |
|---|---|---|
| 1962 | 3,848,944 | 646,991 |
| 1963 | 2,566,113 | 340,999 |

Total Number of Fish from all Sources Stocked:

| | | |
|---|---|---|
| 1962 | 232,024,407 | 793,008 |
| 1963 | 278,061,043 | 418,583 |

Rough Fish Removal

The number of rough fish removed by contract, permit, project, and State crews during the biennium was 19,032,769 pounds.

Licensed Commercial Fishing

Commercial fishing under license in Lake Superior, Lake of the Woods, Lake Namakan and Sand Point Lake, Rainy Lake, and the boundary waters between Wisconsin and Minnesota produced 13,592,050 pounds. The commercial fishery at Redby on Lower Red Lake, operated by the Red Lake Fisheries Association as a cooperative venture of the Red Lake Chippewa tribe, took 2,255,453 pounds of fish during the biennium.

With a very moderate increase in personnel, we plan to accelerate the Fish Habitat Acquisition Program which involves purchasing the marshland type areas adjacent to important fishing lakes. A moderate increase in personnel is required in order to more intensively manage the increasing number of natural spawning and rearing areas for northern pike. In order to obtain maximum production from such areas, they must be watched closely.

Water levels must be controlled and brood stock or the spawning runs watched and controlled. Water temperature and oxygen content must be checked regularly and rearing areas drained to avoid loss of fish due to high temperature and loss of oxygen. The Fish Rescue Program also can be expanded substantially.

With an increase in manpower and equipment, roads can be developed or improved to provide access to more areas of the wild rice and waterfowl type, which generally are ideal for natural reproduction. Rescue activities involve the installation of many special traps during summer and fall, and construction of channels and operation of pumps to attract fish into the traps, before they suffocate from lack of oxygen.

Other types of acquisition include sites for the construction of permanent carp trapping areas, and access to large waterfowl and wild rice types of lakes for the purpose of carrying on northern pike rescue and transfer. Acquisition of stream banks for access and habitat improvement also will be accelerated, particularly on trout streams in areas of heavy usage.

Permits for Changing Lake Beds

A considerable amount of time is required of fish management field personnel to investigate requests from individual lakeshore property owners, as well as from lakeshore developers, for permits to change the lake bottom by dredging, filling, or both. Many such requests for permits must be denied in order to preserve natural spawning and rearing areas.

Since the U. S. Forest Service has funds allotted for fish and wildlife habitat work it is our obligation to provide plans and recommendations for projects. A good work relationship exists; but we are greatly understaffed to carry out the program properly. Cooperation is received from the U. S. Fish and Wildlife Service in connection with fish distribution from the Service and the rescue and transfer of northern pike from Federal wildlife areas. With a few additional positions, we would be in a position to do more advanced planning for projects to be undertaken through the various Federal Aid programs.

## Section of Research and Planning

The Section of Research and Planning of the Division of Game and Fish is made up of four Units: (1) Fisheries Research; (2) Game Research; (3) Fish and Wildlife Surveys; and (4) Biological Services. About two-thirds of the work during the 1962-64 biennium consisted of technical operations of many kinds and the remainder -- research -- the gathering of information and testing of new approaches for future use by management. Technical operations included such items as lake, stream, game area and watershed surveys and mapping; aquatic nuisance control; aid to fish hatchery operations; pilot management and evaluation of present management practices; fish and wildlife censuses; pollution investigations; and various field and laboratory services.

Some highlights of the work during the 1962-64 Biennium:

The run of steelhead trout in the North Shore streams was studied to find means of maintaining and improving the fine spring sport fishery. Inland trout studies include evaluation of the effect of suckers on lake trout populations, experimental two-story lake trout management, and introduction into some waters of new kinds of crustacean and insect trout foods. Pink salmon, an accidental introduction, were watched in the Lake Superior streams and experimental plantings of Kokanee salmon made in certain inland landlocked lakes. An evaluation has been made of stocking methods and fishing use of trout lakes from which trout fish have been removed by chemicals (reclaimed lakes). Work has continued at the trout hatcheries in development of fish diets, disease control and prevention, and trout breeding. This work was accomplished in conjunction with the Section of Fisheries. Trout nutrition problems have been investigated. An investigation is being carried out on the possible effects of accidental introduction of smelt into our inland lakes.

Concerning warm-water fishes, competition between walleyes and smallmouth bass has been investigated; also the effect of large sucker populations on walleyes. The possibility of improving panfish angling by employing a pattern of aquatic weed control is being investigated. Lakes with marl bottoms are often poor producers of fish and an investigation is underway to determine ways of increasing the fish yield. Several studies are aimed at improving walleye fishing, especially through a better understanding of the behavior and life history of this fish. They include studies of production of proper kinds of foods in rearing ponds, early history of fertilization and egg development, use of natural and artificial spawning areas, and survival of naturally spawned eggs. A creel census on Lake Winnibigoshish in Itasca and Cass counties indicates that the total fishing take of walleyes has increased since 1939 but the catch per angler has declined.

Changing conditions in lakes following removal of rough fish with toxicants are being studied, as are conditions which foster excessive growths of algae and aquatic weeds. Some work is being done on the sturgeon. An investigation on use of trawls in Lake-of-the-Woods indicates that this commercial gear takes mostly tullibee and does little damage to walleyes.

Work continued on pheasants at the Madelia Game Research Station; including gathering of information on the populations and kill, on the effects on pheasants because of changing land use. One result has been a recommendation for modification of the Federal Feed Grain Program to provide more and better pheasant nesting cover by proper planting and cutting of oats -- the excellent nest cover. In general the pheasant harvest was good during the biennium -- 900,000 birds in 1962 and 1,040,000 in 1963.

Several aspects of deer research received attention, including studies of deer migration, movement, nutrition, anatomy, and reproduction. Possibilities for improving deer habitat by herbicides and controlled burning

were investigated. Following several mild winters, the deer population has been at a high level as was the hunting take -- 96,000 in 1962 and 112,800 in 1963.

Work on migratory waterfowl included obtaining information on the status of waterfowl populations and the size of the kill in Minnesota; studies of the relationship of land use (including refuges and woodland areas) to duck and goose production; studies of the basic biology and homing tendency of the birds; methods for establishing geese and ducks uninhabited areas, relationship between basic productivity of waters and waterfowl use; and joint work with the Mississippi Flyway Council on establishing management programs and hunting regulations. In Minnesota, hunting kill of waterfowl in 1962 was 328,000 ducks and 16,000 geese; and in 1963 -- 738,500 ducks and 22,700 geese.

Work on furbearers and predators during the biennium was largely restricted to the activities of one man. Statistics were gathered on take of pelts of furbearers. Muskrat, mink, beaver and raccoon made up the bulk of trapping catch with a value to trappers of about $1,500,000 a year.

During the Biennium the Fish and Wildlife Surveys Unit work plan was altered to place more emphasis on watershed surveys. This has been done to facilitate field work, and to allow coordination of game and fish plans with those of other agencies, many of which plan on a watershed basis. A total of 498 fish lakes were surveyed and 285 fish lakes were mapped. The maps and reports are supplied to management personnel for their use. The maps of lakes are also available to the public through the State Documents Section.

The Biological Services Unit issued permits for and gave general supervision in the control of 526 aquatic nuisance conditions (under 408 permits) in 1962 and for control of 617 nuisance conditions (under 469 permits) in 1963. In 1962 a total of 241 lakes were involved and in 1963 - 273 lakes. These projects included control of excessive growths of aquatic plants and algae and destruction of snails which carry swimmer's itch. Other work included pollution investigations which were generally made in conjunction with the Water Pollution Control Board (18 investigations and 87 reports processed); work on insecticides; and tests on the effectiveness and toxicity of aquatic herbicides.

The results of the various phases of the work were presented in 47 published papers (including one bulletin, "The Beaver in Minnesota"), 88 major mimeographed reports and informational items and 492 typewritten reports -- the bulk of which are survey reports. There also are 37 papers in some stage of preparation for publication and several of these have been accepted for publication or are in press.

## The Warden Service

The Warden Service, as the enforcement arm of the Division of Game and Fish, is charged with enforcing laws and regulations pertaining to wildlife, and with conducting a preventive program by seeking support and cooperation of the public.

The public relations and educational efforts so necessary for today's Minnesota game warden require that he have a broad understanding of all phases of wildlife management as well as regulations for harvesting and protecting wildlife. He works in close cooperation with sportsmen's clubs, schools, churches, civic and fraternal organizations to gain their understanding, support and assistance. It is estimated that Minnesota wardens give as many as 2,000 talks in the course of a year.

The Warden Service is headed by the Chief Warden. He has two assistants, one in charge of law enforcement and the other Director of the Youth Firearms Safety program. There is a Supervisor of Confiscations and Seizures; ten area warden supervisors; four warden pilots and 131 game wardens. The clerical staff consists of four clerk stenographers. For Warden Service purposes, the state is divided into ten areas with an area supervisor in charge of each. From 12 to 16 wardens work under each supervisor.

Warden supervisors and game wardens are trained in First Aid and their cars equipped to render assistance relating to hunting, automobile and other accidents which they may encounter.

New employees coming into the Warden Service undergo In-service Training, working with experienced game wardens throughout the state as well as with Sections of Game and Fisheries personnel.

During the past biennium the Division of Game and Fish held In-service Training schools at four areas throughout the state. All Warden Service personnel attended the session in their particular area. In August 1964 the Warden Service held an In-service Training school at St. Cloud, and a two-day law enforcement school, also at St. Cloud. The sessions included briefing by members of the Attorney General's staff to bring wardens up to date on the most recent laws enacted by the State Legislature and the manner in which recent U. S. Supreme Court decisions affect our enforcement work.

The Warden Service has four airplanes equipped with two-way radios and are invaluable in law enforcement work, wildlife censuses and searching for lost persons. There is need for larger planes to assist in making wildlife censuses and for night "deer shining" patrol. The present planes are stationed at Winton, Warroad, Brainerd and Mankato.

The state-owned patrol cars used in the Warden Service are equipped with two-way mobile radios, and, in addition, the Service employs a number of walkie-talkies.

Firearm Safety Unit

Under the Firearm Safety Unit of the Warden Service a total of 16,781 youngsters were trained in the Minnesota Firearm Safety Program during the fiscal year 1962-63. There were 668 new volunteer instructors trained during this same period.

The fiscal year 1963-64 saw 19,168 youths newly-trained, and 586 new instructors, bringing the total of youngsters trained in Minnesota since 1955 to 139,682, and the total number of currently active volunteer instructors in the program to about 2,300. The third session of each Firearm Safety Course generally is taught by game wardens at which time the game and fish laws are explained. In many counties, game wardens also handle the duties of county director for this program.

It is anticipated that the Warden Service will train more than 20,000 youngsters during each year of the coming biennium. In addition to the present firearm safety training, the Warden Service is planning an expanded program to include an over-all conservation education program.

Arrests for this biennium totaled 8,114 compared to 8,829 for the previous biennium.

The number of violations (arrests) in various categories for the biennium ended June 30, 1964 follow:

| | |
|---|---|
| Affidavits (False Statement) | 2 |
| Big Game (General) | 599 |
| Commercial Fishing | 3 |
| Division of Waters | 1 |
| Fishing (General) | 3692 |
| Frogs | 15 |
| Fur Buyers | 2 |
| Game Farms | 1 |
| Illegal transporting of firearms, cars trucks, etc. | 2058 |
| Licenses | 34 |
| License Agents | 24 |
| Minnows | 16 |
| Netting, Whitefish, tullibees, smelt | 34 |
| Parks and Refuges | 99 |
| Pollution | 7 |
| Protected non-game birds | 4 |
| Public Access | 4 |
| Resist Warden | 24 |
| Shelter and Dark House | 391 |
| Skin Divers | 3 |
| Small Game | 283 |
| Taxidermist | 3 |

| | |
|---|---|
| Trapping | 150 |
| Trespass | 41 |
| Waterfowl | 515 |
| Wild Rice | 108 |
| Total Arrests - | 8113 |

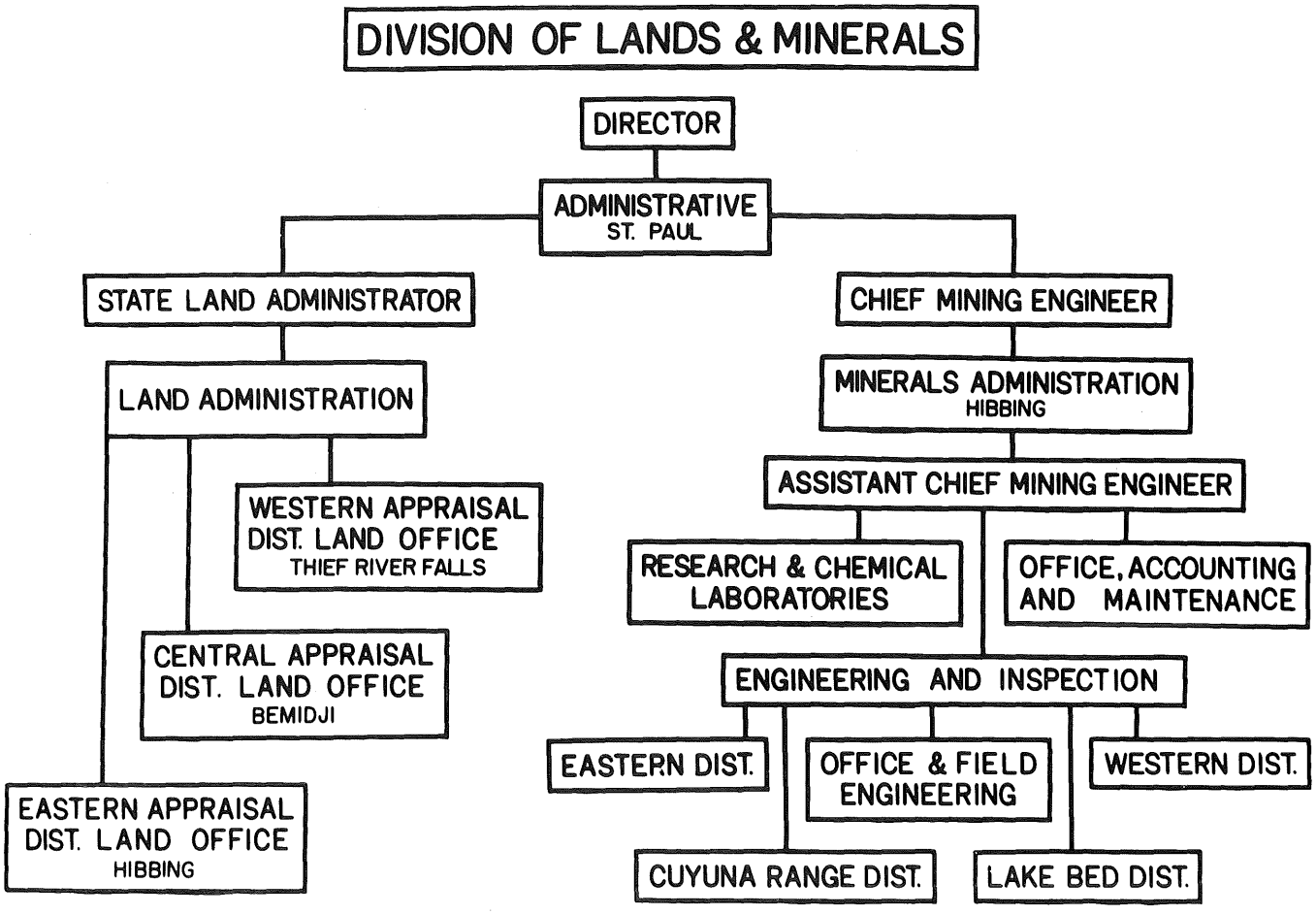
Fines levied against game and fish violators amounted to $204,050.00.

Confiscations ranged from game and fish through fishing equipment, firearms, fur pelts, wild rice, fish nets, and automobiles. In this biennium these confiscated articles amounted to $38,771.84.

# *Lands and Minerals*

Under the 1857 act authorizing a state government, Congress granted to the State of Minnesota millions of acres of land, to be used for the support of public schools, a state university, for erecting public buildings, constructing public roads and other internal improvements. Congress in 1860 further granted to the state all swamp and overflowed lands which had not already been conveyed to the state; in 1862 a grant for an Agricultural College; and in 1870, 72 additional sections for the University.

Part of the swamp land grants were conveyed to railroad companies; but the trust fund lands that were covered by the original State Constitution and the Swamp Land Amendment of 1881, established Permanent Trust Fund Lands that exceeded 5-1/2 million acres.



The Division of Lands and Minerals is charged with the administration of lands owned by the state under the jurisdiction of the Commissioner of Conservation, except those that are located in State Forests, It also acts as agent for the 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 state-owned minerals in areas where iron ore and other minerals are not known to exist.

The division work is divided into two sections -- one covering lands, the other minerals, with headquarters for both in Saint Paul. The Mineral Section under the 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 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, 1964, totaled $5,274,717. A total of $4,892,560 of this was derived from iron ore and other minerals; and the balance, $382,157, was received from sale of state lands and timber and the rental of state lands. Approximately 90 per cent of the total receipts was paid into the state's Permanent Trust Funds.

Minerals acquired by the state through tax forfeiture are administered by this division. Tax forfeited mineral royalties for this period totaled $408,861, most of which was derived from royalty paid under taconite leases. Of this total, 80 per cent was returned to the taxing districts in which the taconite was located and the remaining 20 per cent was retained by the state and deposited in the General Revenue Fund.

From the time of the first shipment of state-owned ore in 1893 until June 30, 1964, a total of 416,763,923 tons of royalty ore has been produced from state-owned properties. Of this amount, 75,016,356 tons consisted of crude taconite.

During the biennium, 20 state-owned mining units were active in producing 31,227,783 tons of royalty ore. Sixteen units were regular natural ore mines, one was a stockpile unit, 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 26,132,269 tons of state-owned crude taconite during the biennium, an increase of 8.5 per cent over the previous biennium. The remainder of the royalty ore, 5,095,514 tons, consisted of iron ore and concentrates produced by natural iron ore mining units.

As a result of negotiations conducted between the state and the Erie Mining Company during the biennium, six taconite leases were issued to Erie covering certain state-owned tax forfeited mineral interests in the Dunka

River Area near the eastern end of the Mesabi Range. Development of a proposed 3.5 mile long pit, which includes lands covered by these leases, is now underway, and taconite is expected to be mined from the area early in 1965. Details covering the addition to Erie's reserve of this high grade magnetic taconite tonnage are outlined elsewhere in this report.

A county by county compilation and review of available geological data, including exploration data available on state lands, has been started by the geologists of this division for use as a basis in setting up geophysical and geological field work needed on state-owned lands. A geophysical program, involving ground magnetic surveys, was started on state-owned lands in the Cuyuna Range and adjoining areas. It will be expanded into other areas during the forthcoming biennium. Results of this work assist the division in evaluating the mineral potential of state lands in these areas, and in determining what additional exploration work is needed.

The Lake Bed Section continued the field examinations and investigations necessary in preparing the engineering data used by the Attorney General's office in litigating the ownership of minerals underlying lakes and water courses. In addition to the detailed engineering work done on specific lakes and rivers on which litigation is in process or anticipated in the immediate future, this section has continued to expand its survey work in known and possible underwater mineral areas.

The transition that is taking place in the iron ore industry makes it necessary for the division to expand the flexibility of its research facilities and to include advanced methods of grinding, sizing, reduction roasting, flotation, agglomeration and other types of mineral beneficiation. Under the present biennial budget, funds were allotted to the division to begin this program. Although additional funds are needed to continue and complete the work, rapid progress is being made and an active research program is being developed.

In addition to the afore mentioned activities, the research section processed and classified over 44,000 feet of drill hole exploration samples, an increase of 19 per cent over the previous biennium. Approximately 150 laboratory tests were made on samples of low grade ore, iron ore tailings, taconite, and non-ferrous minerals. The Chemical Laboratory completed about 12,000 analytical determinations on samples from iron ore shipments, lean ore dumps, and samples from tests that were conducted in the Research Laboratory.

The Land Section continued to carry out a comprehensive program of land leasing and land sale during the biennium. Land appraisers survey and locate state-owned land to determine its value for sale and lease purposes and to recommend the proper use of land which is unsuitable for agricultural purposes or is isolated from schools, roads or settlements. They also appraise and classify tax forfeited lands in Conservation Areas and the Red Lake Game Preserve.

In the two-year period ending June 30, 1964, a total of 9,426 acres of

trust fund land located in 19 counties were sold by the Land Section for $89,650. Receipts from 2,438 surface, lake shore, and miscellaneous leases totaled $98,046. During this same period 25,363 acres of tax-forfeited land located in Conservation Areas and in the Red Lake Game Preserve were sold by county officials after they had been investigated by division appraisers and approved for sale by the Commissioner.

The Division keeps a record of all state-owned land under the control of the Commissioner of Conservation. At the present time these land and mineral ownership records are being set up on an IBM system to make this information more available and useful to the public and other governmental agencies and to help the division program its future activities.

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, under a Conservation Department Work Program which was authorized by the 1963 Legislature, the division completed the following projects: Public access sites were established or improved on 14 lakes, lakeshore lots were developed on three other lakes, and six miles of road was constructed. Under this program a shop project, located at Hibbing, constructed 236 picnic tables, 44 latrines, 158 garbage stands, 200 snow gages, 25 deer traps and more than 1,000 small animal traps and duck nests.

Under a Boat and Water Safety Fund project, the Division constructed additional picnic tables and latrines and also started work on development or improvement of 15 public access sites.

## Transition From Natural Ores

The direct shipments of iron ores in their natural state, which typified Minnesota's iron ranges for over 60 years, now have largely been replaced by concentrated ore. In 1943, the percentage of concentrates shipped from all Minnesota mines was 22.1 per cent (15.4 million tons). This increased to 33.1 per cent (27 million tons) by 1953, and by 1963 the proportion of concentrates equaled 79.4 per cent or 36.3 million tons of a total of 45.7 million tons. The large percentage of increase over 1953 was mainly due to the 17.1 million tons of taconite concentrates shipped in 1963, which represented more than 47.1 per cent of the total concentrates. The percentage of iron ore concentrates shipped from state-owned mines has followed this same pattern, but to an even greater extent. In 1963, 95.6 per cent of the ore shipped from state-owned mines consisted of concentrates.

It should be noted that the grade and structure requirements for these concentrates have also risen. They analysis of the total shipments of iron ore from the Mesabi Range in 1955 averaged 50.43 per cent natural iron and 10.21 per cent silica. In 1963 the total shipment for the Mesabi Range

averaged 56.54 per cent in natural iron, 8.40 per cent silica. Indications now point to even higher grade requirements in the future for Minnesota's iron ore shipments and the necessity of meeting these requirements is emphasized by the fact that in 1963 the analysis of Canadian iron ore shipments averaged 59.29 per cent in natural iron and 6.22 per cent silica.

Even the taconite industry in Minnesota has been affected by the changing grade requirements and much experimental work has been done by the taconite operators to make their production more competitive with pellets and concentrates from other areas. One of the large taconite operators is now experimenting with flotation on a portion of their normal taconite concentrates in an attempt to lower the silica content. Another of the large taconite operators recently has set up a new research department to cope with this and similar problems.

The requirement by blast furnace operators for ores of better structure has placed added emphasis on pelletizing and other forms of agglomeration. Much experimental work is being carried on in attempts to improve the structure of both the natural ores and concentrates prior to their shipment from Minnesota.

## Taconite Development

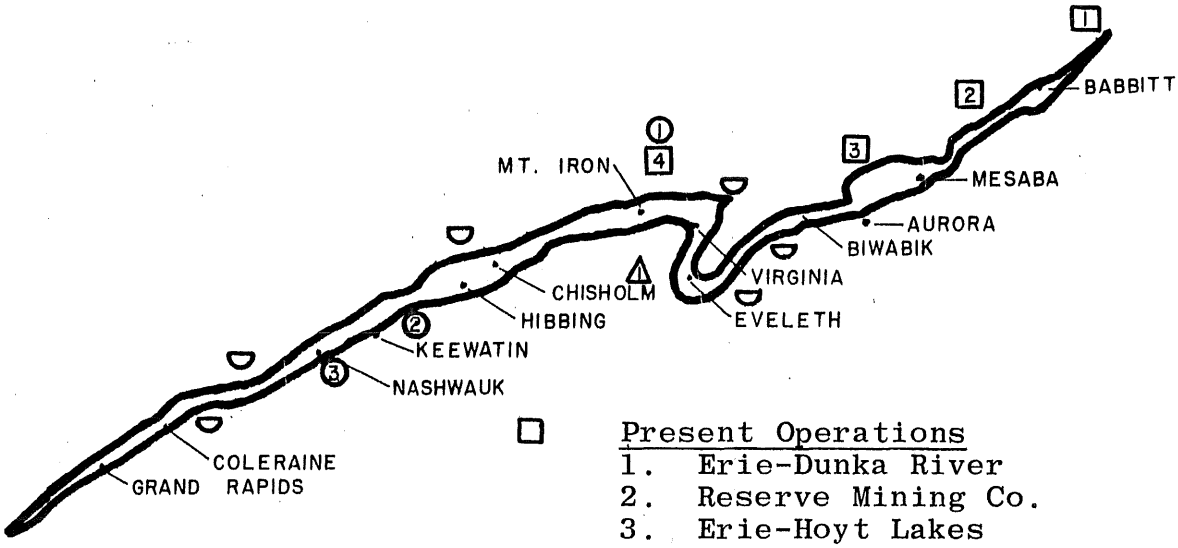
The known open pit area of the Mesabi Iron Formation extends from the Grand Rapids area on the west to Babbitt and the Dunka River area on the east, a distance of over 110 miles. It contains about 105,000 acres of mineral lands. The trust fund lands owned by the state in this area amounts to about 15 per cent of the total and, when combined with the lands that have forfeited for taxes, the total state-ownership of the Mesabi Formation amounts to over 18 per cent.

Taconite is the name that has been given to the hard iron-bearing rock comprising the bulk of the Mesabi Iron Range. A large tonnage of the taconite is not amenable to commercial concentration at the present time, but it has been estimated by engineers of this division and the University that the open pit formation contains about 45 billion tons of crude taconite rock that can probably be concentrated on a commercial basis.

Minnesota, through its trust fund lands and lands that have forfeited for taxes, owns approximately nine billion tons of commercially concentratable taconite which some day can be converted into about three billion tons of high grade taconite concentrates or pellets. This reserve tonnage of state-owned material is particularly impressive when compared with the 2.5 billion tons of natural iron ore and concentrates that have been produced from both state and privately owned mineral lands during the 80 year history of iron mining in Minnesota.

At the present time there are two large commercial taconite plants and one large experimental taconite plant treating magnetic taconites in Minnesota. One of the commercial taconite plants has recently been expanded by an additional 3 million tons per year; and as a result these three units now have a combined capacity of 17-1/2 million tons of taconite pellets a year.

## MESABI RANGE TACONITE OPERATIONS




□ Present Operations
1. Erie-Dunka River
2. Reserve Mining Co.
3. Erie-Hoyt Lakes
4. U. S. Steel-Pilotac

△ Under Construction
1. Oglebay Norton-Ford

○ Construction Announced
1. U. S. Steel Corp.
2. The Hanna Mining Co.
3. The Hanna Mining Co.

Potential Operations

Construction of a new taconite plant with a planned capacity of 1.6 million tons per year has also been started to treat magnetic taconite from the Eveleth area.

Plans have also been announced regarding the construction of three new commercial taconite plants: One in the Mountain Iron area, having an initial capacity of 4-1/2 million tons of taconite pellets per year; one in the Nashwauk area with a plant capacity of 2 million tons of taconite pellets per year; and one in the Keewatin area with a plant capacity of 2.4 million tons of taconite pellets per year.

Another company has been conducting a large-scale exploration and testing program on taconite in the Biwabik area and are considering plans to construct a taconite plant in that vicinity. In addition, other companies are conducting explorations and are working on programs of acquiring taconite reserves capable of supporting a commercial plant.

As indicated above, extensive taconite drilling programs have been conducted during the past biennium; 131 drill holes were put down on state-owned lands alone, by five different companies, for a total depth of over 23,000 feet. Much of this exploration work is expected to continue into the next biennium.

## Reserve Mining Company

The first commercial taconite plant developed in Minnesota is operated by the Reserve Mining Company at Silver Bay and began producing taconite pellets in October of 1955. This plant processes crude taconite mined from the Babbitt area near the eastern end of the Mesabi Range. During this biennium the operators completed a 120 million-dollar expansion program designed to increase their plant capacity from 6 million to 9 million tons of pellets per year. 1964 is the first year of this expanded capacity.

The operators report that this expansion program involved approximately 8,400,000 man hours of work, 1,655,000 square feet of lumber, 4,800,000 cubic yards of earth and rock excavation, 107,500 cubic yards of concrete, 72 miles of railroad grade and trackage, 700 tons of electric wiring and conduit, 2,200 tons of piping, 26,000 tons of structural steel and 27 acres of roofing, sheeting and siding.

During 1964 the Reserve Mining Company established a new division at Silver Bay, to be devoted exclusively to research and development. An exploration program was also conducted during the early part of 1964 in the state-owned portion of their mining area and may result in the expansion of the present taconite quarry to other state lands in this area.

## Erie Mining Company

The Erie Mining Company's Hoyt Lakes Taconite Plant, located near Aurora, started producing taconite pellets in the fall of 1957. This 300 million-

dollar project has a present capacity of 7-1/2 million tons of taconite pellets per year. About one-half of the crude taconite that is being processed by this plant is owned by the state; and during the biennium, 25,848,442 tons of state-owned crude taconite were concentrated in this plant.

As the result of negotiations conducted during the biennium, six taconite leases were issued to the Erie Mining Company covering state-owned tax forfeited mineral interests in the Dunka River area, which is located approximately four miles east of Babbitt, Minnesota and about 15 miles from the Hoyt Lakes Taconite Plant where the Dunka taconite will be concentrated.

Due to tax forfeiture, the state acquired fractional interests in nine forties located within the proposed Erie Dunka pit area. Having acquired the remaining fractional interest in these nine forties, the operators were eligible to negotiate for the state's interest and this resulted in the issuance of the six state taconite leases which were approved by the Executive Council of the state.

If the estimated state-owned Dunka area tonnage of 24 million tons is mined, the total yield will amount to over six and one-half million dollars. Of this, 80% will be distributed to the taxing districts in which the taconite is located, and the balance will be paid into the general revenue fund of the state. Development of the proposed 3-1/2 mile long pit is now under way and taconite is expected to be mined from the area starting January, 1965.

## United States Steel Corporation

Since 1953 the United States Steel Corporation has had a taconite pilot plant in operation near Mountain Iron, which has a capacity of approximately 3/4 million tons of taconite concentrates per year. In November 1964 this company announced plans to construct a commercial taconite plant in the Mountain Iron area, having an initial capacity of 4-1/2 million tons of taconite pellets per year. This plant is expected to be in operation by 1967, during which time it is expected that as many as 4,000 men will be employed in construction activities.

## Oglebay Norton - Ford Companies

In 1963 the Eveleth Taconite Company announced plans for a new taconite plant, with a capacity of 1.6 million tons per year, to treat magnetic taconite from the Eveleth-Virginia area. This is a joint project of Oglebay Norton and Ford Motor and will involve an initial outlay of over 40 million dollars. The actual mining and operation of the processing plant will be conducted by the Oglebay Norton Company. Formal ground-breaking ceremonies were held on June 3, 1964, and construction work is expected to be completed late in 1965.

## The Hanna Mining Company

During the biennium The Hanna Mining Company conducted an intensive

drilling and metallurgical testing program on material from the western Mesabi Range. Initially this work was done in connection with their semi-taconite pilot plant facility, but in the course of their exploration work, a substantial reserve of treatable magnetic taconite was located. As the result of this drilling and metallurgical program, The Hanna Mining Company has announced plans to construct two commercial taconite plants on the western Mesabi Range. The first of these two plants is a joint project of Hanna, Inland Steel and Wheeling Steel Corporation. It will be located in the Nashwauk area and is designed to produce 2 million tons of taconite pellets per year. Construction of this 50 million-dollar plant will begin in the spring of 1965, with completion scheduled by the end of 1966.

The second plant will be a joint project of National Steel Company and Hanna, with National Steel owning 85% of the new pellet company. Hanna will manage the project and plant, which will be located in the Keewatin area and will have a capacity of 2.4 million tons of taconite pellets per year. Construction of this second plant is also scheduled to start in the spring of 1965, and completion is expected by the early part of 1967.

During the latter part of this biennium the Hanna has been conducting engineering studies to determine water availability, tailings disposal area, and waste material stockpile sites which are necessary to support their proposed taconite operations. The company is presently engaged in negotiations to obtain these needed auxiliary lands through sale and land exchanges with the state, county and private land owners in the area south of Nashwauk and Keewatin.

## Potential Taconite Projects

The Jones and Laughlin Steel Corporation began a large-scale taconite exploration program in the Biwabik-McKinley area during the biennium. Although the operators are still conducting tests on the crude magnetic taconite, the results to date have apparently been encouraging, as they are presently negotiating for the lease of additional lands in the area and are investigating a water supply. They have recently indicated that if these tests and engineering studies continue to be successful, they may start construction of a taconite plant in this area within three years.

In addition to those named above, other companies are conducting exploration work and are working on programs of acquiring taconite reserves capable of supporting a commercial plant.

Due to the location throughout the Mesabi Iron Range of state-owned trust fund lands or lands that have forfeited for taxes, most of the taconite operations that are presently in production, or for which construction plans have been announced, will involve large tonnages of state-owned crude taconite.

Although the treatment of magnetic taconites has been carried on commercially for many years, research work is still being conducted to improve the

methods of concentration and the efficiency of the various processes used. Autogenous grinding, roasting, flotation and other processes are being tested by many of the private companies, and federal and state agencies in an attempt to improve the grade and structure of the taconite concentrate and economics of the magnetic taconite industry.

## Semi-Taconite; Reduction Roasting and Direct Reduction

Large 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, which probably will require roasting, flotation, or some other complex method of treatment in order to produce high grade concentrates. Pilot plant tests on semi-taconite that were being conducted by two of the major mining companies were continued until the latter part of the biennium. While a feasible concentration process appears to have been developed, no plans have been announced for processing semi-taconite on a commercial basis in the immediate future.

Continued attention, however, is being given by these and other operators and by various state and federal agencies, to possible methods of treating low grade natural ores and semi-taconite. A large amount of laboratory test work and some pilot plant work is being conducted on the techniques of autogenous grinding, reduction roasting, electro-dynamic separation, flotation, agglomeration, and pre-reduction of pellets, in an attempt to improve the grade and structure of these low grade materials so as to make them competitive in the rapidly changing iron ore market. Ores from a number of state-owned properties have been involved in these tests.

Although progress in blast furnace technology in the last few years has lessened some of the pressure on the development of direct reduction processes, a number of companies and governmental agencies are continuing to investigate this method and its adaptibility to various types of iron ores and to present market conditions.

## Proposed Legislation

The changing pattern of the iron mining industry from natural iron ores to taconite makes further changes in state policy and iron ore lease laws necessary. Such laws should be amended in order to promote the mining of state-owned iron-bearing material which is not being mined or concentrated at the present time. Changes in royalty schedules, ore classifications, the escalator base, and other revisions are needed in order to adapt our present lease laws to the methods of mining and concentration that are being developed.

Many mineral reservations have been made throughout the years by former owners of lands located in Minnesota, and the lack of records dealing with the ownership of these mineral reservations has interfered with the proper administration of mineral lands that have been acquired by the state through tax forfeiture. As a follow-up on previous efforts of the state legislature

and this department, a bill requiring registration of all mineral reservations that have been separated from the surface title will be submitted to the next session of the legislature.

## Mineral Outlook

In addition to this Department, many agencies such as the University of Minnesota, the Minnesota Geological Survey, the U. S. Bureau of Mines and the Mining Industry are experimenting with, and exploring for the various kinds of minerals that are located in Minnesota--not only for iron bearing material, but also with the possibility of developing, in the future, the state's reserve of manganese, copper, nickel, titanium and other metals and minerals that exist in the state, but which are not being produced on a commercial basis at the present time.

This biennial period has been highlighted by a number of significant developments in Minnesota's mineral industry. The two new "finds" of magnetic taconite--one in the Dunka River area and one in the Nashwauk-Keewatin area--are particularly important. Development of both are already underway.

The expansion of one existing taconite plant, the construction of four new taconite plants, the plans under consideration for other taconite plants, and the enormous amount of research and exploration activity being conducted, clearly indicate the start of a new era of mining activity in Minnesota. Due to the year-round operations associated with the processing of taconite, the new mining industry that is developing promises a much more stable economy for the iron mining areas in Minnesota than they have known in the past.

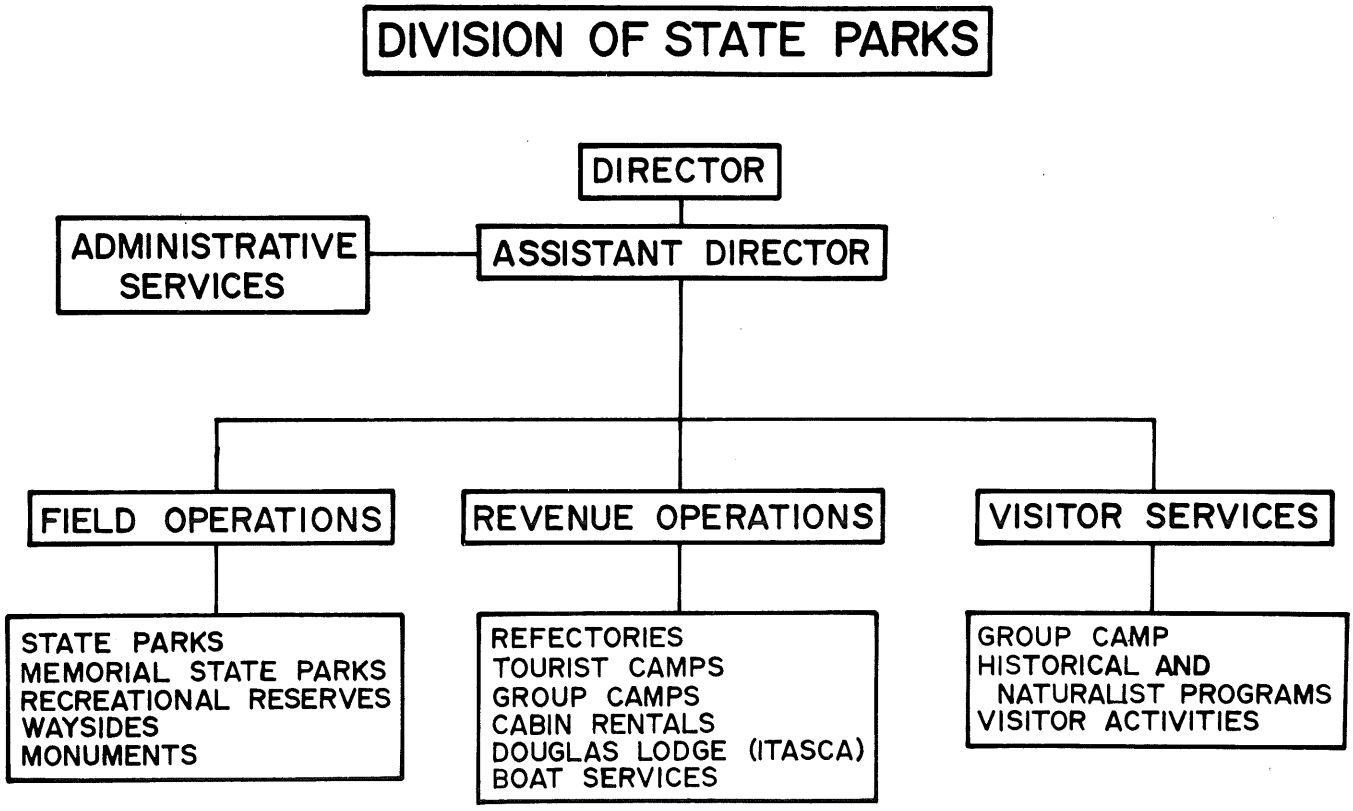
# *State Parks*

Minnesota's State Park system was conceived for purposes clearly expressed in the National Park Act:

"To conserve the scenery and the natural and historic objects, and the wildlife therein, and to provide for the enjoyment of the same in such a manner and by such means as will leave them unimpaired for the enjoyment of future generations."

The first official unit in the Minnesota Park System was created by the Legislature of 1889, which passed an act establishing Camp Release near Montivideo. The second state park, Itasca, was established in 1891. Itasca's 32,214 acres make it the largest unit in the present park system.

By 1942, the year marking the end of the accelerated park programs of the depression era of the 1930's, the Minnesota system had increased to 63 units of approximately 54,000 acres. Today, including presently authorized land acquisition programs and others in various stages of completion, our park system constitutes 86 units of an estimated 165,000 acres. Minnesota ranks seventh nationally in total State Park acreage.



Much of our North Star State Park acreage increase has been realized over the past six years via 22 new park authorizations. Park expansion programs were given further impetus by the 1963 Natural Resources Act, which authorized 14 new parks and strategic additions to 22 existing parks. It is also important to note that five park areas, because of location and characteristics, have been transferred to the more proper jurisdiction of cities.

Development of the Minnesota State Park system dates from the construction of Douglas Lodge at Itasca in 1905. An estimated $10 million worth of development was realized through the relief programs of the 1930's. In the period from 1942 to 1953, the physical plant suffered from a lack of preventative maintenance. Since then, however, over $6 million has been invested in programs of rehabilitation and improvement.

Over a period of years, attendance has increased on an average of 7% annually. Last season visitations were estimated at 3,328,000 and 507,000 camper days were registered. On the basis of conservative projections, we may anticipate seven million Minnesota State Park visitations by 1970. Camping will be limited to the facilities that can be provided without damaging park values. There are hopeful signs that private enterprise is prepared to fill the need for developments which will help cope with unprecedented pressures on camping space.

Today, as never before, there is an evident "hunger" on the part of our citizens to escape the confining and artificial environment of cities; to seek out green space and open space; to get closer to nature and to realize those inner satisfactions which are most difficult to define, but which come through intimate association with the beauty of America's great outdoors.

To meet this demand for recreational space -- and there are many who call it "breathing space" -- additional park areas and additions to existing parks will be necessary, as well as a continued program of development.

Minnesota's ten-year Natural Resources Act constitutes an inspiring and imaginative program through which the necessary park objectives can be attained. Equally essential, however, is continued evidence of that vital ingredient which is manifesting itself today as it has since 1891. This ingredient is public interest. Indeed, it may be said that the State Park system is a reflection of a "labor of love" by Minnesota citizens -- citizens motivated by great pride and an intense desire to perpetuate those values which are so meaningful to all Minnesotans.

Minnesota's State Park system officially became a part of the Department of Conservation in 1935, when the Legislature of the State of Minnesota formally established the Division of State Parks under Chapter 340.

The Division of State Parks is headed by a director who is in the unclassified service. The authorized full-time complement of personnel is 52.

Major functions of the Division are:

1. Maintenance, operation and development of State Parks, Recreation Reserves, Waysides and Monument sites constituting the State Park system.

2. Operation of revenue producing services.

3. Operation of Interpretive (Naturalist) Programs for the enjoyment of the visiting public.

Major objectives of State Parks are to spearhead the drive for state, county and local parks and to anticipate the projected recreational pressures of a changing world. Specific goals and objectives are:

1. To materially expand the State Park system.

2. To develop the individual park units consistent with the philosophy of greatest possible use with the least possible damage to natural values.

3. To extend the jurisdiction of the State Highway Department to include the building of main park roads as well as local roads from the park to the nearest State Trunk Highway.

4. To expand the Naturalist program.

5. To assist in the establishment and development of county or multi-county park systems -- which are practically non-existent in Minnesota today.

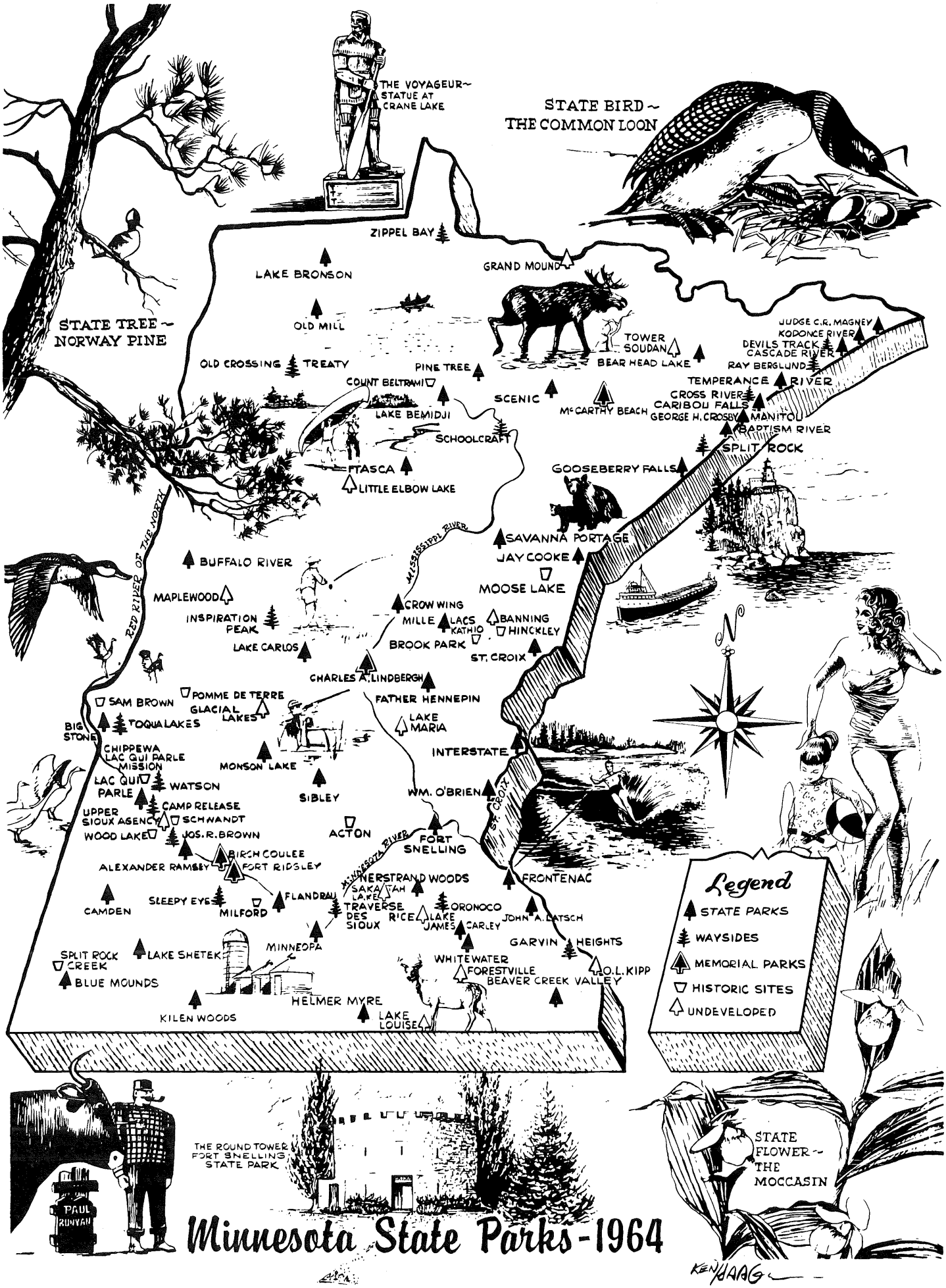
6. To establish a system of canoe routes.

The Division of State Parks is financed primarily from General Revenues of the State including funds derived from the sale of state obligated revenue bonds. Second largest net source of funds constitutes the dedicated receipts from the sale of State Park permits. Working Capital (Revolving Fund) constitutes gross receipts from all types of revenue producing operations -- exclusive of park permit sales -- and in a large measure represents dollar turnover on merchandise sales as well as service cost on non-profit operations such as lifeguards on bathing beaches.

# MINNESOTA CONSERVATION DEPARTMENT
# DIVISION OF STATE PARKS
*Facilities Offered by Our State Parks*

| STATE PARKS | LOCATION | Acreage | Picnic Grounds | Swimming Beach | Historic & Nature Trails | Fishing: Stream | Fishing: Lake | Boats | Camp Ground | Children's Group Camp | Food Services | SPECIAL FEATURES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Banning | 1 Mi. N. of Sandstone | | UNDEVELOPED | | | | | | | | | Kettle River flowing through scenic rock gorges; historic Sandstone quarry. |
| Baptism River | 33 Mi. N.E. of Two Harbors | 746 | X | | X | X | | | | | | Outstanding scenic beauty; highest waterfall in Minnesota. |
| Bear Head Lake | 10 Mi. E. of Tower | 4418 | X | | | | X | | X | | | Scenic Bear Head Lake in a wilderness setting. |
| Beaver Creek Valley | 3 Mi. W. of Caledonia | 393 | X | | X | X | | | X | | | Beautiful natural steep bluff valley with a huge spring. A trout stream through its length. |
| Big Stone Lake | 5, 15 & 17 N.W. Ortonville | 248 | X | X | | | X | | X | | | A series of 3 areas along Big Stone Lake important for scenic and prehistoric record of man in Minnesota. |
| Birch Coulee | 1½ Mi. N. of Morton | 82 | X | | X | | | | X | | | Site of one of the hardest fought battles of the 1862 uprising. |
| Blue Mounds | 7 Mi. N.E. of Luverne | 246 | X | X | X | | X | X | X | | | Historic prairie hunting grounds of the Sioux, unusual geological Sioux quartzite. |
| Buffalo River | 12½ Mi. E. of Moorhead | 385 | X | X | X | | | | X | | | Prairie oasis and prehistoric Campbell beach of Lake Agassiz. |
| Camden | 7 Mi. S.W. of Marshall | 470 | X | X | X | X | | | X | | | Natural wilderness valley in prairie farming area. |
| Caribou Falls | 45 Mi. N.E. of Two Harbors | 92 | X | | X | X | | | | | | Rugged gorge, waterfalls and scenic and geological formations. |
| Cascade River | 10 Mi. W. of Grand Marais | 1895 | X | | X | X | | | X | | | Mountainous rocky terrain along Lake Superior with twisting rocky gorge. |
| Charles A. Lindbergh | 2 Mi. S. of Little Falls | 110 | X | | X | | | | X | | | Boyhood home of famous flying colonel. Along wooded bank of Mississippi River. |
| Crow Wing | 8½ Mi. S.W. of Brainerd | 448 | X | | | | | | X | | | Location of historic Crow Wing village site; important in the fur trade and Red River ox cart days. On beautiful wooded banks of Mississippi. |
| Father Hennepin | ½ Mi. N.W. of Isle | 198 | X | | X | | X | | X | | | Deciduous forest with extensive shore line on Mille Lacs Lake. |
| Flandrau | N.W. cor. of New Ulm | 836 | X | X | X | | | X | X | X | | Cottonwood River Valley with high bluffs with picturesque lake. |
| Flood Bay | East of Two Harbors | 12 | X | | | | | | | | | Lake Superior Sand Beach. |
| Forestville | West of Preston | | UNDEVELOPED | | | | | | | | | Scenic segment of the Root River Valley and abandoned townsite of Civil War era. |
| Fort Ridgely | 7 Mi. S. of Fairfax | 225 | X | | X | | | | X | | | Site of some of the fiercest battles of the 1862 Sioux Uprising. |
| Fort Snelling | Junction of Minnesota and Mississippi Rivers | 343 | | | X | | | | | | | Oldest building in state instrumental in opening territory to settlement. High bluffs overlooking broad Minnesota River Valley. |
| Frontenac | 1½ Mi. E. of Frontenac Station | 562 | X | | X | | | | X | | | Rolling native woodlands along N.W. shore of Lake Pepin; site of historic 1880 river town. |
| George H. Crosby-Manitou | 3½ Mi. E. of Little Marais | 3300 | | | X | X | | | | | | Mountainous rock and forest area with 4 miles of Manitou River including 2 waterfalls. |
| Glacial | 5 Mi. S. of Starbuck | 1305 | UNDEVELOPED | | | | | | | | | Lake and panoramic view of surrounding country. Outstanding prairie and forest vegetation. |
| Grand Mound | 11 Mi. W of International Falls | | UNDEVELOPED | | | | | | | | | 7 large Indian mounds and virgin deciduous forest. |
| Gooseberry Falls | 40 Mi. N.E. of Duluth | 718 | X | | X | X | | | X | | X | Beautiful rocky Lake Superior north shore coastline. Stream with series of falls and rapids. |
| Helmer Myre | 5 Mi. S.E. of Albert Lea | 128 | X | | X | | | | X | | | Heavily wooded island in Albert Lea Lake. |
| Interstate | At Taylors Falls | 167 | X | | X | X | | X | X | | | "Glacial Garden" of outstanding geological rock formation. In narrow rocky valley of St. Croix River. |
| Itasca | Midway between Bemidji and Park Rapids | 32,214 | X | X | X | | X | X | X | X | X | A large area of lakes and forests and source of Mississippi River. |
| James A. Carley | 4 Mi. S. of Plainview | 211 | X | | | | | | X | | | Rugged steep sloped wood valley of north branch of White Water River. |
| Jay Cooke | West of Duluth | 8920 | X | | X | X | X | | X | | | Spectacular terrain with St. Louis River running through picturesque gorge. |
| John A. Latch | 14 Mi. N. of Winona | 350 | UNDEVELOPED | | | | | | | | | Limestone bluffs and panoramic view of Mississippi River. |
| **Judge C. R. Magney** | **15 Mi. E. of Grand Marais** | **1100** | X | | X | X | | | X | | | **Waterfalls and boiling rapids of Arrowhead River form exceptional geological and scenic values.** |
| Kilen Woods | 7 Mi. N.W. of Jackson | 201 | X | | X | X | | | X | | | In the Des Moines River Valley. Scenic hills and woods in middle of rolling farm land. |
| Kodonce River | 11 Mi. E. of Grand Marais | 128 | X | | X | X | | | | | | Spectacular rocky gorge. |
| Lac Qui Parle | 8 Mi. N.W. of Montevideo | 438 | X | | | | X | | X | | | Heavy hardwood timber along Lac Qui Parle and Chippewa Rivers. |
| Lake Bemidji | 5 Mi. N.E. of Bemidji | 285 | X | X | X | | X | X | X | | | Virgin pine forests and heavily timbered and sandy lakeshore. |
| Lake Bronson | 2 Mi. E. of town of Lake Bronson | 896 | X | X | X | | X | X | X | | | Artificial lake with irregular shoreline in middle of open farm country. |
| Lake Carlos | 10 Mi. N. of Alexandria | 1010 | X | X | X | | X | X | X | X | | Rolling topography with variety of deciduous trees along a sandy shoreline. |

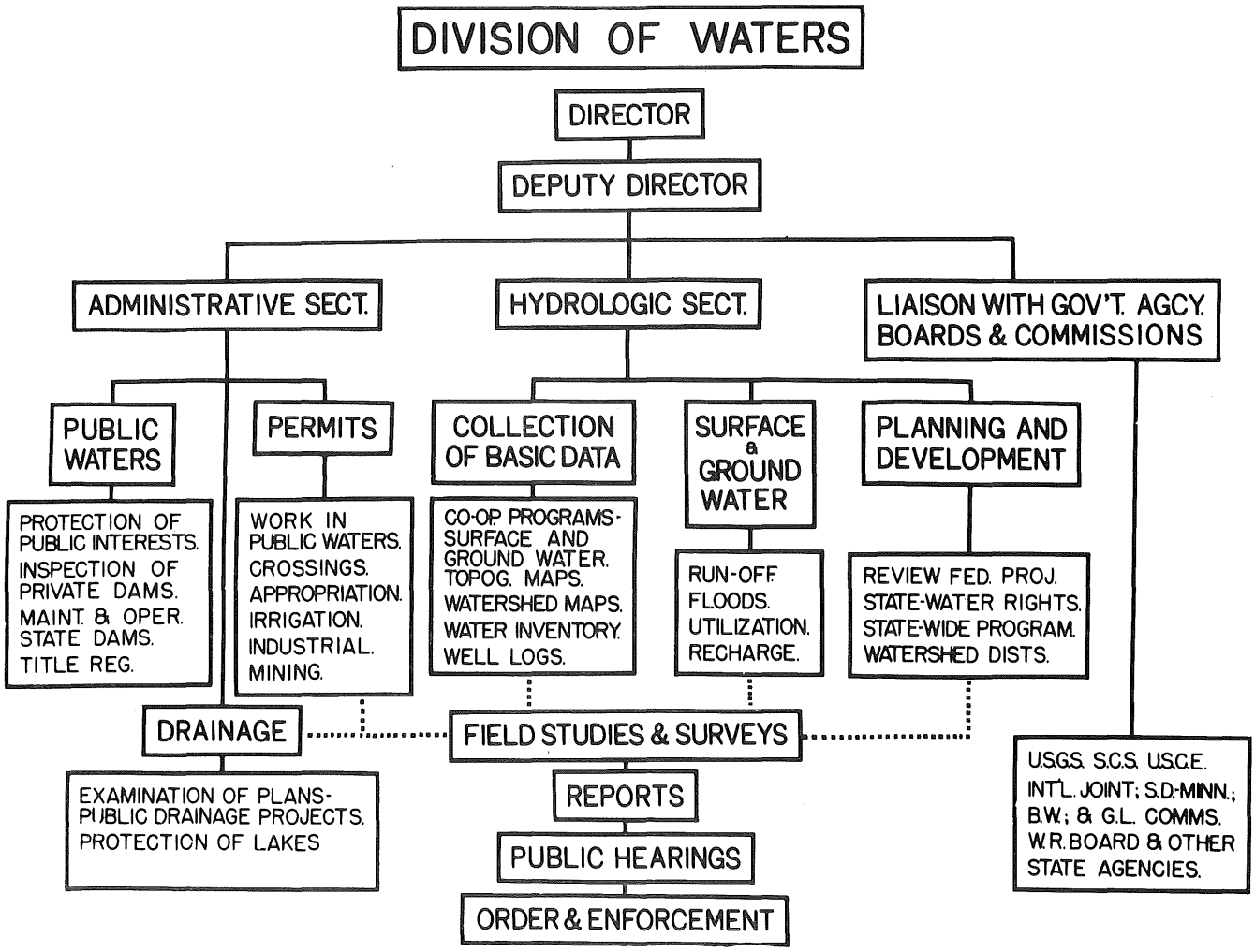
| STATE PARKS | LOCATION | Acreage | Picnic Grounds | Swimming Beach | Historic & Nature Trails | Stream / Lake Fishing | Boats | Camp Ground | Children's Group Camp | Food Services | SPECIAL FEATURES |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lake Louise | 29 Mi. S.E. of Austin | 575 | X | | | | | | | | A wooded area at the junction of 2 streams that form a lake impoundment. |
| Lake Maria | Near Monticello | | UNDEVELOPED | | | | | | | | Heavily rolling land with deciduous tree cover which surrounds 2 small lakes. |
| Lake Shetek | 3 Mi. N. of Currie, 10 Mi. S.W. of Tracy | 392 | X | X | X | | X | X | X | X | Wooded shoreline on one of the few larger lakes in this section of Minnesota, and site of a massacre of 1862 Sioux Uprising. |
| Little Elbow Lake | 16 Mi. E. of Waubun | | UNDEVELOPED | | | | | | | | Heavily rolling land with deciduous tree cover including 3 lakes. |
| McCarthy Beach | 20 Mi. N.W. of Hibbing | 135 | X | X | X | | X | X | X | | Heavy virgin pine timber on rolling hills between 2 lakes with exceptional sand beaches. |
| Maplewood | E. of Pelican Rapids | 263 | UNDEVELOPED | | | | | | | | Spectacularly beautiful portion of Minnesota including about 20 lakes. |
| Mille Lacs Kathio | 5 Mi. N.W. of Onamia | 7100 | X | | | | X | | X | | Large park of hills, meadows and forest, and site of the major battle between the Sioux and Chippewa. |
| Minneopa | 6 Mi. W. of Mankato | 116 | X | | X | | | | X | | Waterfalls in a deep wooded gorge and historic mill site. |
| Monson Lake | 3 Mi. S.W. of Sunberg | 199 | X | | X | | X | | X | | Wooded area on lake and site of a massacre in 1862 Sioux Uprising. |
| Nerstrand Woods | 10 Mi. S.W. of Northfield | 595 | X | | X | | | | X | | Remnant of big woods in central Minnesota with picturesque prairie creek. |
| O. L. Kipp | ½ Mi. from LaCrescent | | UNDEVELOPED | | | | | | | | Inspiring view of Mississippi River Valley and apple orchards. |
| Old Mill | 17 Mi. N.E. of Warren | 285 | X | X | X | X | | | X | | Typical prairie terrain except for a rolling valley with a winding river. |
| Oronoco | Adjacent to Village of Oronoco | 105 | X | X | | | X | | X | | |
| Pomme de Terre | 1 Mi. S.E. of Morris | 363 | X | X | X | | X | | X | | Artificial lake and wood area in western prairie. |
| Rice Lake | 12 Mi. W. of Owatonna | | UNDEVELOPED | | | | | | | | Virgin deciduous forest and all of Rice Lake. |
| St. Croix | 20 Mi. E. of Hinckley | 30,557 | X | X | X | X | | X | X | X | A large park with pine, spruce, hardwoods, wildlife; the St. Croix River and several smaller rivers flow through this area. |
| Sakatah Lake | Near Waterville | 660 | UNDEVELOPED | | | | | | | | Heavily wooded primarily virgin forest. |
| Savanna Portage | 10 Mi. N.E. of McGregor | 12,979 | X | | X | X | X | | X | | Bordering Big Sandy Lake. The major link in the Grand Portage of the St. Louis with a wilderness character. |
| Scenic | 40 Mi. N. of Grand Rapids | 2121 | X | X | X | | X | X | X | | Most primitive of all Minnesota state parks. Virgin Norway pine stands. Beside an unspoiled lake. |
| Schoolcraft | 8 Mi. S. of Deer River | 120 | X | | | X | | | X | | Historic Indian wild ricing site. Pine forest lands embracing a section of the Mississippi River. |
| Sibley | 7 Mi. W. of New London | 1033 | X | X | X | | X | X | X | X | Virgin hardwoods cover moraine hills along a sand shore of Lake Andrew. |
| Split Rock Creek | 1 Mi. S. of Ihlen | 220 | X | X | | | X | | X | | Recreational area along artificial lake. |
| Temperance River | 2 Mi. E. of Schroeder | 112 | X | | X | X | | | X | | Spectacular rocky river gorge with large potholes on Lake Superior. |
| Traverse Des Sioux | ½ Mi. N. of St. Peter | 2 | X | | | | | | | | Site of historic village of Traverse Des Sioux and location of the signing of a treaty of 1858 with the Sioux. |
| Tower-Soudan | At Village of Tower | 982 | (In Process of devel.) | | | | | | | | Minnesota's deepest and oldest underground iron mine on Lake Vermilion. |
| Upper Sioux Agency | 8 Mi. S.E. of Granite Falls | | UNDEVELOPED | | | | | | | | On the banks of picturesque Yellow Medicine River the historical location of a Government outpost to serve the Sioux. |
| Whitewater | Midway between Winona and Rochester | 748 | X | X | X | X | | | X | X | Southern Minnesota's most popular park formed by a deep ravine with limestone formations and hardwood forest. |
| William O'Brien | 2 Mi. N. of Marine-on-St. Croix | 487 | X | X | X | X | | X | X | | Beautiful wooded rolling countryside with frontage on the St. Croix River. |
| Zippel Bay | 9 Mi. N. of Graceton on Lake of the Woods | 2738 | | | | X | | | X | | Gently sloping lands bordering an exceptional beach area on Lake of the Woods. |
| **WAYSIDES** | | | | | | | | | | | |
| Cross River | 25 Mi. S.W. of Grand Marais | 600 | UNDEVELOPED | | | | | | | | Deep River gorge along Lake Superior. |
| Devils Track | 1 Mi. N.E. of Grand Marais | 160 | UNDEVELOPED | | | | | | | | Two high falls and cascades on Lake Superior stream. |
| Inspiration Peak | 12 Mi. W. of Parkers Prairie | 82 | X | | X | | | | | | Panoramic view of lakes and 3 counties. |
| Pine Tree | 1 Mi. W. of Blackduck | 30 | X | | | | X | | X | | Wooded area on major northern lake. |
| Ray Bergland | 4 Mi. E. of Tofte | 54 | X | | X | | | | | | Cascades on Onion River — a Lake Superior stream. |
| Sleepy Eye | In town of Sleepy Eye | 7 | X | | | | | | | | Picnic area. |
| Split Rock | 8 Mi. S.W. of Beaver Bay | 35 | | | X | X | | | | | Panoramic view overlooking Lake Superior and Split Rock Light House. |
| Toqua Lake | ½ Mi. S. of Graceville | 40 | X | | X | | | | | | Wooded area on shore of one of the few lakes in western part of state. |


THE VOYAGEUR~ STATUE AT CRANE LAKE
STATE BIRD ~ THE COMMON LOON
STATE TREE ~ NORWAY PINE
ZIPPEL BAY
LAKE BRONSON
GRAND MOUND
OLD MILL
TOWER
SOUDAN
BEAR HEAD LAKE
JUDGE C.R. MAGNEY
KODONCE RIVER
DEVILS TRACK
CASCADE RIVER
RAY BERGLUND
TEMPERANCE RIVER
CROSS RIVER
CARIBOU FALLS
GEORGE H. CROSBY MANITOU
BAPTISM RIVER
SPLIT ROCK
OLD CROSSING TREATY
PINE TREE
COUNT BELTRAMI
SCENIC
McCARTHY BEACH
LAKE BEMIDJI
SCHOOLCRAFT
ITASCA
LITTLE ELBOW LAKE
GOOSEBERRY FALLS
MISSISSIPPI RIVER
SAVANNA PORTAGE
JAY COOKE
MOOSE LAKE
RED RIVER OF THE NORTH
BUFFALO RIVER
MAPLEWOOD
INSPIRATION PEAK
CROW WING
MILLE LACS
KATHIO
BANNING
HINCKLEY
LAKE CARLOS
BROOK PARK
ST. CROIX
CHARLES A. LINDBERGH
FATHER HENNEPIN
SAM BROWN
POMME DE TERRE
GLACIAL LAKES
LAKE MARIA
BIG STONE
TOQUA LAKES
CHIPPEWA
LAC QUI PARLE MISSION
INTERSTATE
MONSON LAKE
LAC QUI PARLE
WATSON
SIBLEY
WM. O'BRIEN
ST. CROIX
UPPER SIOUX AGENCY
CAMP RELEASE
SCHWANDT
WOOD LAKE
JOS. R. BROWN
ACTON
FORT SNELLING
MINNESOTA RIVER
ALEXANDER RAMSEY
BIRCH COULEE
FORT RIDGLEY
INTERSTATE PARK
FRONTENAC
CAMDEN
SLEEPY EYE
MILFORD
FLANDRAU
SAKATAH LAKE
TRAVERSE DES SIOUX
RICE LAKE
ORONOCO
JOHN A. LATSCH
JAMES CARLEY
GARVIN HEIGHTS
SPLIT ROCK CREEK
LAKE SHETEK
MINNEOPA
WHITEWATER
FORESTVILLE
BEAVER CREEK VALLEY
O.L. KIPP
BLUE MOUNDS
HELMER MYRE
LAKE LOUISE
KILEN WOODS
Legend
STATE PARKS
WAYSIDES
MEMORIAL PARKS
HISTORIC SITES
UNDEVELOPED
THE ROUND TOWER FORT SNELLING STATE PARK
PAUL BUNYAN
STATE FLOWER ~ THE MOCCASIN
Minnesota State Parks - 1964
KEN DAAG

# *Waters*

Under authority delegated by the Commissioner of Conservation, the Division of Waters has general administrative jurisdiction over the waters of the state, surface and underground. It is responsible for the development of a general water resources conservation program for the state, and for basic water resources investigations.

Its objectives are the protection, development and management of the state's water resources to the end that they may continue to serve the needs of the people of the state. These needs, however, continue to change. Expanding population, growing industry, increased leisure time, bring with them a demand for more abundant and dependable water supplies and greater recreational use of lakes and streams. In response to these changing requirements, the division's activities have increased, and may be expected to continue to increase.



## Water Resources Studies

In 1959 a Hydrologic Atlas of Minnesota, Division of Waters Bulletin #10, was published, summarizing briefly the water resources and water problems of the state. In this publication 39 watershed units were designated for study purposes, and the future publication of individual reports on each of these units was proposed. Bulletin No. 11, Water Resources of the Minneapolis-St. Paul metropolitan area, 1961, was the first of these unit studies to be published. Beginning in July 1963, acceleration of these studies was made possible by the appropriation of additional funds from the Natural Resources Fund, part of which was allocated to the cooperative agreement between the Division of Waters and the U. S. Geological Survey, Water Resources Division.

## Collection of Basic Hydrologic Data

Basic hydrologic data consists of weather records, of records of the flow of water in streams and of fluctuating water levels in lakes and reservoirs, of water levels in wells and of the changes in these produced by natural causes or by pumping, and of the chemical and physical properties of water. Data on the topography of the land surface, and on the nature of soil cover, soils, sub-soils, and the underlying rock formations is also essential.

The Division of Waters annually concludes an agreement with the U. S. Geological Survey, Water Resources Division, for the collection of basic data on surface water, ground water, and quality of water. Under this agreement all funds contributed by the state are matched dollar-for-dollar by federal funds. Under this agreement, the following activities were in progress at the end of the biennium:

49 stream gaging stations
Stream flow measurements at 5 miscellaneous sites
38 lake stage stations
45 observation wells measured continuously or periodically
28 lake or stream stations at which samples of water are taken periodically for chemical analysis
Chemical quality analyses of water from selected wells
Measurements of suspended sediment load in selected streams

As of June 30, 1964, there were in operation in Minnesota, under all programs, the following stations:

110 stream gaging stations
87 lake or reservoir stage stations
60 observation wells
137 crest gage (high flow) stream stations
Approximately 50 stations for chemical quality analysis
Sediment-discharge measurements at 24 sites

From July 1, 1962 to June 30, 1964, 560 well logs were filed with the Division of Waters by water well contractors operating in the state.

## Technical Services

Technical services to other agencies were performed as follows:

Provided technical assistance in preparing specifications for 31 wells in State Parks and Forestry areas. Made ground water investigations at the Aitkin Fish Rearing Pond. During the summer and fall of 1963, technical services were provided to the Minnesota Highway Department in collecting and preparing ground water data, in connection with litigation, at a site along Interstate Highway 35E in Arden Hills; also in recommending and supervising procedures to make pumping tests on test wells in glacial drift along the storm tunnel alignment in south Minneapolis. Interpretive reports were prepared. Made investigation and prepared report on cause of seepage from Powderhorn lake during the summer of 1963. Pumping tests were completed on nine wells during the biennium.

## Corps of Engineers Projects

Matters relating to water development projects of the U. S. Corps of Engineers in Minnesota, proposed, under construction, or completed have been acted upon from time to time during the biennium. These projects are listed as follows:

1. Lost River and Ruffy Brook
2. Mississippi River Headwaters Reservoirs
3. Big Stone Lake - Whetstone River
4. Duluth - Superior Harbor
5. St. Paul - South St. Paul Flood Wall
6. Warroad River - Bulldog Creek
7. Zumbro River
8. Mississippi River Small Boat Harbors
9. Minnesota River Navigation Channel
10. Little Fork River at Cook Flood Protection
11. St. Anthony Falls Navigation Locks
12. Redwood River at Marshall Flood Protection
13. South Fork Yellow Medicine River at Minneota
14. Roseau River Flood Control Project
15. Wild Rice River Flood Control Project
16. Root River Flood Control Project
17. Bassett Creek Flood Control Hearing
18. Lake of the Woods Navigation
19. Rum River Flood Control Project
20. Red Lake River Flood Control Project
21. St. Anthony Falls Protection Project

## Topographic Mapping

During the biennium July 1, 1962 through June 30, 1964, seventy-five 7-1/2 minute quadrangles and seven 15 minute quadrangles were published. Three of these were a remapping of 7-1/2 minute quadrangles of the Iron Range, previously mapped in 1950.

During the biennium 6.05 per cent of the state was mapped. As of June 30, 1964, the total area of the state covered by topographic maps is 44.04 per cent or 750 of the 1703 7-1/2 minute quadrangles into which the state is divided.

Maps partly completed at the end of this biennium include:

| Number | Quadrangle Size | Sponsor |
|---|---|---|
| 153 | 7-1/2 minute | State Cooperative Program |
| 76 | 7-1/2 minute ) | Federal or adjoining state |
| | ) | cooperative |
| 3 | 15 minute ) | program |

This is equivalent to 14.1 per cent of the state.

Many depth curves or sounding maps of Minnesota lakes were prepared by the U. S. Forest Service in cooperation with the Civilian Conservation Corps in the late 1930's. More recent surveys were made by the Department of Conservation. The Geological Survey in November 1960 agreed to show depth curves of lakes on quadrangle maps. Nearly 800 depth charts have been sent to the Survey since that time. To date 496 lakes are shown on preliminary quadrangles and 487 are shown on 76 published quadrangle maps. As older maps are reprinted in the future, depth curves for lakes which have been charted will be shown.

In October 1961 the U. S. Geological Survey accepted the Division of Waters' proposal to show and label drainage systems on the maps. Fifty-one watershed and drainage maps showing drainage systems were sent to the Survey for this purpose. To date 70 drainage systems have been so shown and labeled.

## Expenditures For The Biennium

July 1, 1962 through June 30, 1964

1. State of Minnesota Coop Mapping Program:

| | |
|---|---|
| State appropriation, fiscal year 1963 (1/2 biennium) | $ 72,000 |
| State appropriation, fiscal year 1964 (1/2 biennium) | 188,000 |
| Federal allotment, fiscal year 1963 | 72,000 |
| Federal allotment, fiscal year 1964 | 188,000 |

2. Federal Mapping Program:

| | |
|---|---|
| Fiscal year 1963 | $ 246,046 |
| Fiscal year 1964 | 234,478 |

## State Dams

On 14 state dams major modifications were completed during the biennium. In most cases this consisted of replacing the removable stop-logs with solid concrete wiers, in order to increase outflow capacity or to prevent tampering by unauthorized persons. Routine inspection, maintenance and repairs were carried on throughout the biennium.

Under a special appropriation made by the 1961 legislature for construction and reconstruction of dams, a new dam was constructed at the outlet of Lightning lake, Grant county. This replaced an existing loose rock dam and resulted in a better range of water levels on the lake. Acquisition of the legal rights necessary for the reconstruction of a state dam on the Snake river at the outlet of Cross lake at Pine City was completed by condemnation of flowage easements on 75 parcels of land. A total of 744 easements were acquired for this project, largely through the efforts of a group of local citizens, thus clearing the way for the necessary construction in the fall of 1964. The dam closure became effective on October 20, 1964.

## Minnesota River Channel Improvement

Work was continued on the project for improving the channel of the Minnesota river. In the first year of the biennium removal of snags creating a hazard to small-boat navigation was completed between Shakopee and Mankato. A sharp increase in pleasure boat traffic and in the construction of facilities for pleasure boaters in this stretch of the river has been reported.

In July 1963 an additional appropriation of $40,000 became available for continuing this work. A new contract was let for snag removal and dredging of shallow portions of the channel between Mankato and New Ulm. High water conditions prevented work under this contract until May 1964, and work was stopped again by extreme low water in the river in the summer of 1964. The work will be continued when water conditions permit.

## Thief River Channel Improvement

A project for improving the channel of Thief River in Marshall and Pennington counties was undertaken in the winter of 1963-64, in order to increase the channel capacity for conducting flood flows and to make it available for recreational boating. Snags and standing timber were removed from the bed and banks of the river over an 8 mile stretch below the Agassiz National Wildlife Refuge. The work was done by local labor under the supervision of the Marshall County Highway Engineer, and will be continued during the winter of 1964-65.

## Summary of Surveys And Field Investigations

| Number of Surveys | Type of Survey |
|---|---|
| 22 | Surveys for projects proposed for the improvement of lakes or streams |
| 1 | Surveys for the determination of natural ordinary high water mark |
| 5 | Surveys made in connection with operation or maintenance of state or other dams |
| 29 | Surveys or investigations made for the protection of lakes or streams |
| 22 | Investigations of reported violations of state law |
| 2 | Surveys in connection with permit applications |
| 3 | Investigations made because of complaints (flooding, low water levels, etc.) |
| 84 | |

## Drainage Reports During Biennium July 1, 1962 to June 30, 1964

1. Received and examined 121 engineers reports and plans.
2. Prepared and submitted 4 Director's preliminary reports.
3. Received and examined 95 final engineers reports and plans.
4. Prepared and submitted 95 directors final reports.
5. Prepared and submitted 7 supplemental directors final reports.
6. Area of watershed involved in these drainage projects was 1085.6 square miles.
7. Estimated costs of these drainage projects was $5,923,681.
8. Twenty-six of the preliminary reports received were still in preliminary proceedings on June 30, 1964.

## Conferences and Committees

The Division of Waters is regularly represented by the director or staff members at periodic meetings of the following committees, conferences and boards.

Midwestern States Flood Control and Water Resources Conference
Midwest Ground Water Conference
Advisory Board on Pollution of Rainy River and Lake of the Woods (IJC)
Missouri River Main Stem Coordinating Committee
Red River Basin Planning Committee
Upper Mississippi River Comprehensive Basin Study
State Mapping Advisory Board

## Permit Section

| | | |
|---|---|---|
| Applications Pending July 1, 1962 | | 122 |
| Applications Received to July 1, 1964 | | 2245 |
| Total number of applications requiring action | | 2367 |

Summary of Actions Taken:

| | | |
|---|---|---|
| Found Not Required | 9 | |
| Denied | 46 | |
| Withdrawn | 123 | |
| Action Pending | 185 | |
| Issued | 2004 | |
| Total number of applications requiring action | | 2367 |

Classification of Permits Issued:

| | | | |
|---|---|---|---|
| I. | Change of course, current or cross section | | |
| | a. Lake and stream improvement | 1176 | |
| | b. Highway construction | 318 | |
| | c. Mining construction | 9 | |
| | d. Miscellaneous | 157 | |
| | Total | | 1660 |
| II. | Appropriation of Water | | |
| | A. Surface | | |
| | 1. Municipal | 13 | |
| | 2. Industrial | 31 | |
| | 3. Mining | 4 | |
| | 4. Irrigation | 62 | |
| | Total | | 110 |
| | B. Ground | | |
| | 1. Municipal | 50 | |
| | 2. Industrial | 29 | |
| | 3. Mining | 1 | |
| | 4. Irrigation | 46 | |
| | Total | | 126 |
| III. | Utilities Crossings | | |
| | a. Over | 46 | |
| | b. Under | 62 | |
| | c. Other | 0 | |
| | Total | | 108 |

| | | |
|---|---|---|
| Total number of permits issued | | 2004 |
| Applications upon which action is pending | 185 | |

Total receipts for materials removed from the beds of public waters for which reinbursement, at the rate of two cents per cubic yard for muck, silt and debris and ten cents a cubic yard for sand, gravel and rock, was received in the amount of $13,696.82 for the biennium.

## Recapitulation of Waters' Permits Issued July 1, 1937 to June 30, 1964

| For Calendar Year | Disposition of Applications | | | | | | Classification of Permits Issued | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Changing Course, Current & Cross Section | | | | Appropriation of Waters | | |
| | Pending and Received | Withdrawn | Denied | Not Required | Action Pending | Issued | Lake and Stream Improvement | Highway Construction | Mining | Other | Surface | Ground | Public Utilities |
| 1937 | 2 | | | | | 2 | | 1 | | | 1 | | |
| 1938 | 263 | 11 | 7 | | | 245 | 3 | 234 | 1 | 3 | 1 | 3 | |
| 1939 | 102 | 4 | | 2 | 1 | 95 | 11 | 78 | | 1 | 1 | 2 | 2 |
| 1940 | 35 | 1 | 1 | 4 | 1 | 28 | 16 | 8 | | 1 | 2 | 1 | |
| 1941 | 21 | 2 | 1 | 1 | 1 | 16 | 11 | 1 | | 2 | 1 | 1 | |
| 1942 | 19 | 7 | | | 3 | 9 | 6 | | | | 1 | 2 | |
| 1943 | 17 | 1 | 1 | | 2 | 13 | 3 | 7 | 2 | | | 1 | |
| 1944 | 25 | 12 | 1 | 1 | 1 | 10 | 5 | 1 | 1 | 3 | | | |
| 1945 | 27 | 8 | | | 6 | 13 | 5 | 3 | 1 | | 2 | 2 | |
| 1946 | 66 | 2 | 1 | 2 | 2 | 59 | 34 | 6 | 1 | 7 | 5 | 2 | 4 |
| 1947 | 55 | | 3 | 2 | 2 | 48 | 25 | 7 | 1 | 6 | 8 | 1 | |
| 1948 | 85 | 10 | 5 | 2 | | 68 | 42 | 1 | 3 | 4 | 12 | 2 | 4 |
| 1949 | 121 | 10 | 6 | 3 | 7 | 95 | 72 | 1 | 2 | 1 | 12 | 5 | 2 |
| 1950 | 178 | 9 | 7 | 15 | 23 | 124 | 72 | 7 | 3 | 5 | 32 | 4 | 1 |
| 1951 | 222 | 9 | 1 | 13 | 23 | 176 | 90 | 8 | 3 | 6 | 54 | 13 | 2 |
| 1952 | 289 | 9 | 8 | 9 | 29 | 234 | 124 | 39 | 9 | 5 | 39 | 10 | 8 |
| 1953 | 296 | 5 | 2 | 8 | 33 | 248 | 102 | 59 | 10 | 23 | 29 | 10 | 15 |
| 1954 | 359 | 20 | 4 | 12 | 19 | 304 | 155 | 63 | 11 | 6 | 38 | 3 | 28 |
| 1955 | 473 | 18 | 5 | 18 | 34 | 398 | 224 | 69 | 5 | 12 | 70 | 8 | 10 |
| 1956 | 436 | 39 | 14 | 10 | 44 | 329 | 110 | 82 | 2 | 22 | 71 | 17 | 25 |
| 1957 | 485 | 45 | 10 | 10 | 40 | 380 | 182 | 99 | 4 | 5 | 45 | 12 | 33 |
| 1958 | 753 | 60 | 14 | 6 | 42 | 631 | 380 | 135 | 1 | 6 | 48 | 26 | 35 |
| 1959 | 947 | 65 | 17 | 29 | 60 | 776 | 516 | 82 | 2 | 2 | 57 | 88 | 29 |
| 1960 | 1011 | 42 | 9 | 19 | 78 | 863 | 549 | 121 | 2 | 5 | 35 | 117 | 34 |
| 1961 | 1215 | 56 | 25 | 6 | 78 | 1050 | 681 | 127 | 1 | 5 | 88 | 90 | 58 |
| 1962 | 879 | 53 | 22 | 4 | 77 | 719 | 413 | 135 | 1 | 8 | 36 | 58 | 48 |
| 1963 | 1237 | 68 | 30 | 3 | 106 | 1030 | 591 | 170 | 2 | 86 | 63 | 70 | 48 |
| 1964 | 854 | 30 | 7 | 3 | 185 | 629 | 357 | 97 | 7 | 77 | 37 | 32 | 28 |