

# STATE OF MINNESOTA

## DEPARTMENT OF IRON RANGE RESOURCES AND REHABILITATION



BIENNIAL REPORT  
1962 - 1964

DEPARTMENT OF IRON RANGE RESOURCES AND REHABILITATION

Room 60, State Office Building, St. Paul, Minnesota

St. Louis County Court House, Hibbing, Minnesota

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Virginia, Minnesota

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Conservation Department

- - -

Robert W. Mattson, Special Assistant  
Attorney General



**STATE OF MINNESOTA**  
DEPARTMENT OF  
**IRON RANGE RESOURCES AND REHABILITATION**  
60 STATE OFFICE BUILDING  
SAINT PAUL, MINNESOTA 55101

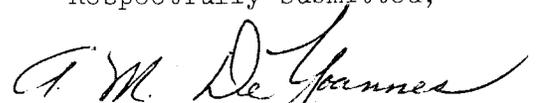
To the Governor and the Legislature  
of the State of Minnesota:

It is my pleasure to submit the Eleventh Biennial Report of the Department of Iron Range Resources and Rehabilitation in compliance with Minnesota Statutes 1961, Section 298.22, Subd. 2.

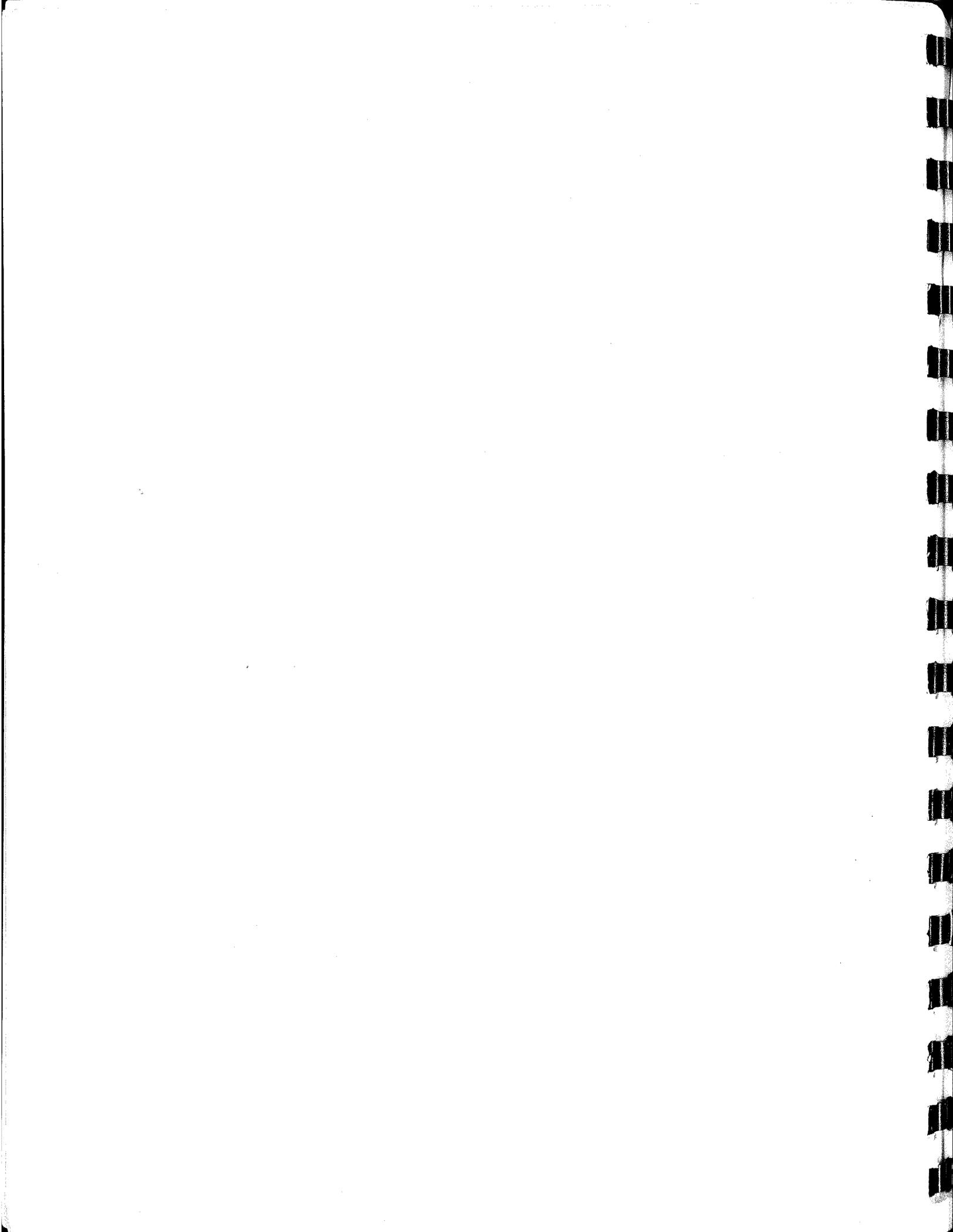
This is the report for the Sixty-fourth Legislature of the State of Minnesota, including the fiscal years ending June 30, 1963, and June 30, 1964.

Copies of this report are available for members of the State Legislature and all State departments, as well as Federal, County and local agencies interested. Schools and libraries may obtain copies upon request. A limited supply will be available to the general public.

Respectfully submitted,

  
A. M. DeYOANNES, Commissioner

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STATE OF MINNESOTA



## HISTORY

The Iron Range Resources and Rehabilitation Commission was created by the 1941 Minnesota Legislature (Minn. Statute 298.22). This developed as the result of requests by public officials and residents of Duluth and the Iron Range communities for a program to avert an almost certain economic crises as a result of declining mining and timber activity.

In 1941 new tax-relief legislation reduced the per capita levy limit for Range communities and school districts over a ten-year period. The levy limits were reduced at the request of the mining industry, which paid the greatest share of taxes levied by political subdivisions located in the Cuyuna, Mesabi and Vermillion Ranges.

The Junior Chambers of Commerce of Northeastern Minnesota, working with Duluth and Range area legislators, prevailed upon Governor Harold Stassen to set aside a percentage of the occupation tax on iron ore for a program for the development of a rehabilitation program for the area.

Unemployment was a serious problem as the mining industry indicated the state's reserve of high-grade ore was being depleted, and the state's laws regarding taxation and mineral reservations forced them to reduce their Minnesota operations and consider other sources for their raw material, including Canada and foreign countries.

In spite of the fact that the bulk of the state's approximately 18 million acres of commercial forests are in the Northeastern Minnesota area, there was also a serious unemployment problem in the communities and areas which were dependent upon that industry for their economy, similar to the conditions prevailing in the mining industry area.

Funds derived from the State occupational tax, dedicated to the I.R.R.&R. Department, were to be used in a program to develop natural resources and rehabilitate the residents of the area who were the victims of these economic conditions affecting the mining and timber industry.

World War II changed the economic conditions in less than a year after the rehabilitation program was launched. To meet the demands created by the war crisis, many mining operations were activated again, thousands of young men answered the call to arms and unemployment was no longer a problem. These conditions prevailed not only during the war years, 1941 through 1944, but for approximately ten years following the end of the war during the so-called post-war production boom, revived again by the Korean War in 1951.

Twenty years later the same conditions prevailed as existed when the law was established in 1941.

## THE MINING INDUSTRY

Mining operations were greatly reduced as the high-grade ores became exhausted, increased costs and reduced employment were the result of technological advances. Serious taxation problems forced the mining industry to locate and invest in other countries, encouraged by tax write-offs, lower labor rates and other distinct economic advantages.

Unemployment was again a serious problem in Northeastern Minnesota, especially in the mining communities. Employment in the mining industry dropped from over 20,000 in 1957 to a low of 12,000 in 1961.

Today we enter another new economic phase in the area. The passage of the Taconite Amendment by an overwhelming 7 to 1 majority on Nov. 4, 1964, has assured the Range communities of a revival of the mining industry in the area; 80% of the voters in the State approved the proposal.

Although there will be investments of millions of dollars in the new taconite plants, as a result of the passage of the Taconite Amendment, certainly a boon to the economy of the area, the Minnesota State Employment Service projection indicates that the total mining employment in 1975 will be approximately 6,000 less than the peak year of 1957.

According to a report published in 1963, mining employment will increase only slightly between 1962 and 1975, from 12,800 to 13,000. The increase of 200 is the difference between the taconite increase of 4,000, and the non-taconite decrease of 3,900.

These figures are not as depressing as they suggest as far as the employment situation on the Range is concerned. They do not take into consideration the thousands who will be employed during the construction period of the plants.

Late in 1964 the Ford Motor Co. and Oglebay Norton Co. plant at Eveleth and Forbes had over 800 employees in construction of its \$40,000,000 plant, which was started in June 1964.

The United States Steel Corp. started construction at its proposed \$100,000,000 plant at Mountain Iron within a few weeks following the election and is expected to have up to 5,000 construction workers over a three-year period. Fulltime employment for the operation and maintenance of the Oglebay Norton Co. plant is estimated at 400; for the U.S. Steel plant an estimated 2,500 will be employed on a fulltime basis. The Oglebay Norton Co. will be ready to operate in 1965; U.S. Steel in 1967.

The biennial report for the IRR&R for 1960-62 indicated there was as much a need for the IRR&R program at that time as in 1941, when economic conditions were practically the same, in spite of a 20-year span of time.

The facts and figures outlined above substantiate that the need for a rehabilitation program for Northeastern Minnesota is greater today than it was in 1941 and again in 1961.

Unemployment will still be a problem when the plants are completed and the taconite operations are in full swing. There will be need for a rehabilitation program for area residents, displaced miners, considered too old and unqualified for the skilled and semi-skilled labor required by these plants.

There is still a great need for diversification of industry, development of other resources in the region, of which this section of the State is overwhelmingly blessed. Population shifts because of the new taconite industry are creating problems, there will be added demand for better tourism, more outdoor recreation facilities.

Satellite industries will be essential to the new economic structure in Northeastern Minnesota when the taconite industry goes into full operation. These industries will service the taconite operations, provide employment for the surplus labor which is inevitable with the increased automation in modern mining methods, and the anticipated increase in population predicted for the next 25 years.

### DIVERSIFICATION

The State's forest industry is a valuable and a renewable resource. This must be protected while at the same time being utilized to expand the forest-products industry to add to the economic welfare of the State and local communities, and help spread the tax base so that the mining industry will not be expected to assume the tremendous tax burden the area and population of the State will demand. See Forestry Division Report page 8.

That's why diversification is essential for a continuing balanced economy; the area will always be subject to dips into depression if it remains under the monopoly of one big industry. Iron Range Resources can help develop a diversified economy and play an important part in the rehabilitation of the people and its area, which is at the cross roads of a new economic era -- new mining techniques, a new concept of tourism and outdoor recreation, resulting in population shifts and many changes in Duluth and the Iron Range area.

It is more important now than ever before in the history of the Iron Range to develop natural resources in the area, other than iron ore, and create better economic conditions for new industries and more job opportunities.

### RESEARCH FUNDS

IRON RANGE RESOURCES HAS CONTRIBUTED MUCH TO THE DEVELOPMENT OF THE TACONITE INDUSTRY. A TOTAL OF \$2,127,084 IN IRR&R FUNDS HAS BEEN APPROPRIATED TO THE UNIVERSITY OF MINNESOTA MINES EXPERIMENT STATION BY LEGISLATIVE TRANSFER, ALL OF WHICH WAS EXPENDED FOR THE BENEFICIATION OF LOW GRADE ORES AND RESEARCH IN TACONITE.

A total of \$237,549.75 has been appropriated by legislative transfer and within the department budget for the Commission on Taxation and Production of Iron Ores, which played an important role in the legislative programs which encouraged the development of the taconite industry and continuation of beneficiation of low grade ore operations in Minnesota.

In addition a total of \$145,122 was spent on research programs with private mining firms, in co-operation with the Area Redevelopment Administration during the past biennium.

A total of \$2,509,756 of IRR&R funds has been appropriated for research in the iron ore industry of Minnesota. Legislative transfers to the University of Minnesota School of Mines has increased every year -- in fact more than doubled in the past 10 years, from \$100,000 in 1947 to \$387,984 appropriated for the past biennium. Meanwhile IRR&R funds have decreased every year in the past ten, from \$2,420,000 in the 1956-58 biennium to approximately \$1,119,000 for the past biennium. (See page 3).



Iron Range Resources has some additional income, besides the percentage of the State's occupational tax. Since 1941, when the legislature passed a bill to establish a so-called revolving fund, all payments to the State for projects financed with IRR&R funds have been returned to the IRR&R Department.

Up to April, 1961, these payments were returned to the State's general revenue fund, total \$1,003,614. Since the revolving fund was established, up to June 30, 1964, a total of \$104,432 has been returned to the IRR&R Department. A total of \$58,461 was repaid during the 1962-64 biennium.

Receipts from the revolving fund are limited because most of the contracts are spread over a period of from five to twenty years, resulting in nominal payments in spite of rather large original total investments. Although helpful, these receipts fall far short of the drop in occupational tax receipts each year.

It is estimated that present projects operating with IRR&R funds on re-payment contracts, will bring in approximately \$100,000 for the next biennium.

### IRR&R'S FUTURE

Unless there is a change in the present taconite tax structure, which does not include any appropriation for the IRR&R from its occupational tax, the department will be gradually phased out of existence, with a continuing reduction in receipts as the direct shipping ores decline in proportion to the increase in taconite.

In five years, by 1970, Dr. Eugene Pfleider, Professor of Mineral Engineering at the University of Minnesota, estimates production capacity of taconite will be 30,000,000 tons. All other ores will be beneficiated with a very limited occupation tax resulting. If this is true IRR&R can expect very limited funds each year for its operating budget, plus the repayments which will be paid up within the next ten years.

In 1963 the percentage of concentrates shipped from all Minnesota mines was 79.4 percent -- or 36.3 million tons of a total of 45.7 million tons. Taconite represented 47.1 percent of the total concentrates, or 17.1 million tons, according to Ray Nolan, Director, Division of Lands and Minerals, in the 1962-64 Minnesota Conservation Department's Biennial Report.

The IRR&R receives nothing from the occupational tax on taconite and less on concentrates (other than taconite) because of certain tax credits allowed which are not computed on natural ores.

Iron Range Resources, because of the very reason for its existence, has appropriated funds for some experimental and research programs which have failed to develop proposed industries to create new employment, or encouraged investment in some of the natural resources in the area.

On the other hand, the IRR&R can take credit for helping several firms with financing, consulting services, records and reports, which developed into successful industries, resulting in new employment and considerable private investments, while using resources which previously had little use or value in the area.

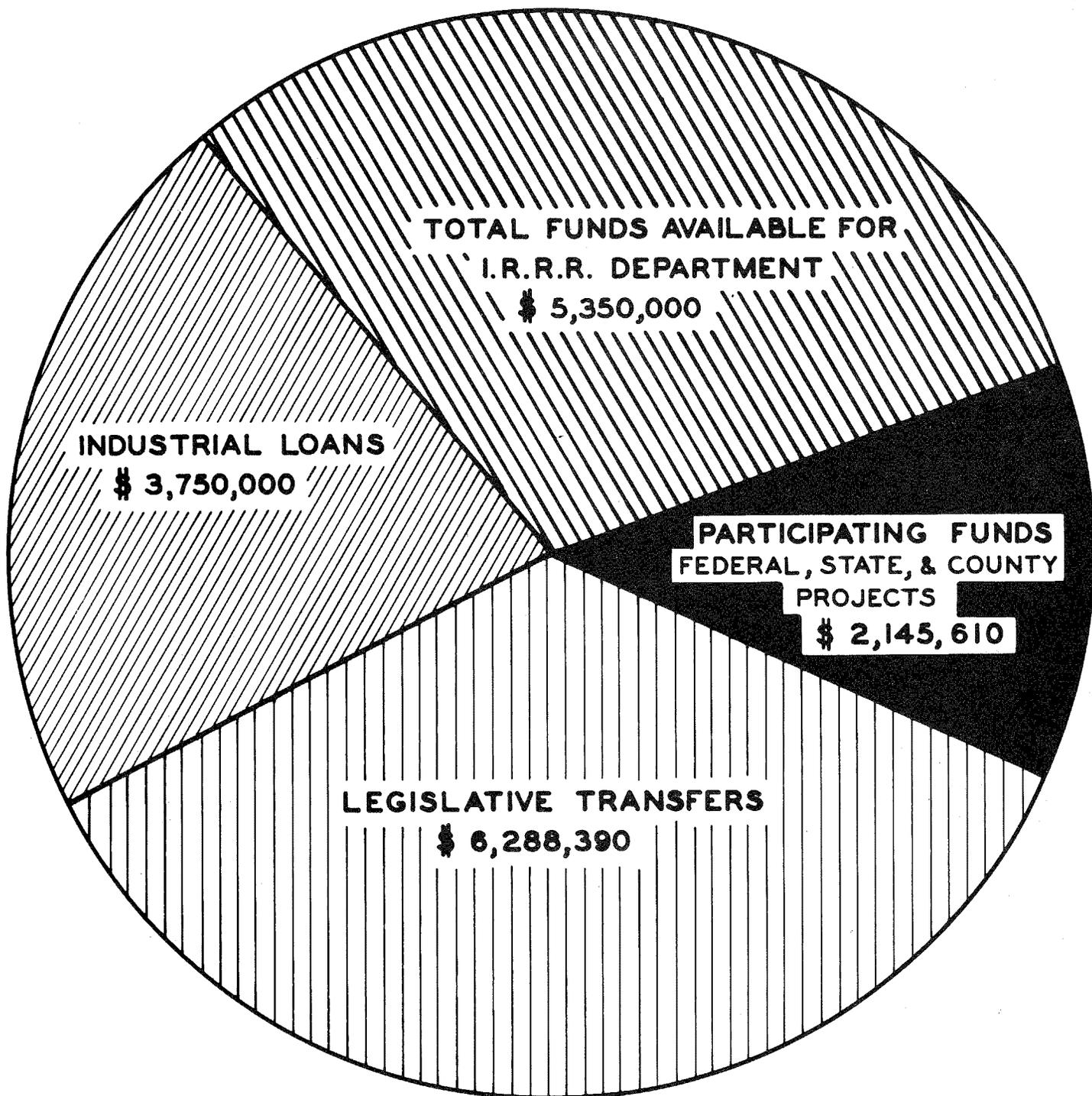
Total receipts from the occupational tax on iron ore for IRR&R from 1941 through 1964 was \$17,534,000. Of this amount \$6,288,390 was diverted from this department by legislative transfers for use by other State agencies. A total of \$3,750,000 was appropriated for industrial loans of which more than \$1,100,000 has been paid back to the State. A total of \$2,145,610 was appropriated as participating funds for federal, state, and county projects. This means that of the total \$17,534,000 less than one-third or a total of \$5,350,000 was available for IRR&R department personnel and projects. (See page 5).

### PROJECT RESULTS

During the past 20 years the IRR&R has provided industrial loans totaling approximately \$3,750,000.

The benefits from these projects, in payrolls, use of natural resources that otherwise would have no commercial value, and the benefits extended to suppliers of raw materials, and equipment and services for these new industries, greatly offset the cost of those projects which failed. The failures, however, have some compensation, as in the case of all pilot and experimental projects, with resulting facts and information that otherwise would be unknown and eventually cost the government or private industry untold thousands to discover.

**FINANCIAL STATEMENT  
I.R.R.R.  
1941-1964**



**TOTAL RECEIPTS FROM OCCUPATIONAL TAX  
\$ 17,534,000**

## IRR&R PROJECT REPORTS

Following are some of the industries financially assisted by IRR&R which today are active and successful, providing new employment and contributing to the economy of the area:

TITLE	IRR&R FUNDS PROVIDED	STATUS CODE	PRESENT NO. EMPLOYEES
The Chun King Corporation, Duluth	\$ 200,000	A	750
Nu-Ply Corporation, Bemidji	350,000	B	105
Superwood Corporation, Duluth	367,500	A	250
Mesabi Grow Co., Inc., Central Lakes	11,673	B	12
Kimball & Sons Company, Hill City	38,000	C	4
Rustic Fence, Inc., Northome	55,000	B	20
Minnesota P & O Mfg. Co., Inc., Virginia	75,000	C	6
Formed Fiber Products, Inc., Floodwood	19,000	D	15
Great River Lumber Company, Deer River	70,000	B	20
Duluth Filter Company, Duluth	18,280	B	10
Lookout Mountain Ski Lodge, Inc., Virginia	33,589	B*	4
Typha Products, Inc., Northome	9,768	B*	4
Arrowhead Seed Growers Coop., Cook	27,654	B	4
Mills Cash Sales, Inc., Grand Rapids	117,126	B	4

(Code: A - Repayment contract completed--paid in full.  
 B - Repayment contract in effect. B\* - Delinquent.  
 C - Repayment contract pending.  
 D - Payments being made on purchase contract.)

Two of these firms, The Chun King Corporation and Superwood Corporation, have paid back in full the amount appropriated for the purchase of buildings and equipment for their respective operations. The Chun King employment figures include employees in the Duluth plant only. The Chun King Corporation is today a firm of international fame with additional plants at Jackson, Ohio; Cambridge, Maryland; and Windsor, Ontario, Canada. Total employment for the firm runs between 1300 and 1600 persons.

Two other firms, Mills Cash Sales, Inc., Grand Rapids, and Formed Fiber Products, Inc., Floodwood, are purchasing from the State buildings originally established under lease-purchase contract. Mills Cash Sales, Inc. was originally the Arrowhead Canning Company in which the State invested \$209,765 from 1945 through 1959. The firm was dissolved when the State terminated its contract because of default of contract terms, and the State is leasing the building to Mills Cash Sales, Inc. which has been current in payments since 1960. Formed Fiber Products, Inc., Floodwood, purchased the former Floodwood peat processing plant in which the State invested approximately \$200,000 from 1944 through 1949.

For two of these firms, Duluth Filter Company, Duluth, and Mesabi Grow Co., Inc., Central Lakes, the IRR&R Commission appropriated considerably more than is under contract at present. Duluth Filter Company requested \$50,000, but to date is under contract for only \$18,280 of this amount spent during the past biennium. Mesabi Grow Co., Inc., Central Lakes, requested \$50,000 but likewise are under contract for only \$11,673 which was spent for equipment during the biennium.

Minnesota P & O Mfg. Co., Inc., Virginia, went into production late in the fall of 1964, so the repayment contract was not effective as of July 1, 1964.

Kimball & Sons Company, Hill City, formed a new corporation which has offered to operate the plant and enter into a repayment contract.

Two of the firms have been delinquent in payments during the biennium. Lookout Mountain Ski Lodge, Inc. indicated not enough business to meet payments, and Typha Products, Inc., Northome, is conducting a market study before going into production.

In addition to the 14 firms listed above, which at present employ a total of 1,208 people, State-owned equipment purchased for a plant at McGregor, Minnesota, which failed in 1958, was made available to several firms on lease-purchase contracts. This made it possible for these firms to increase production and employment. One firm, Durkee Manufacturing Co., Inc., Pine River, completed its contract payments in 1964 and bid on the purchase of equipment for a total of \$702.50, after using this machinery on a rental basis for three years. Firms presently using IRR&R equipment for their operations on a lease-purchase contract are:

Ameriply Veneer Co., Grand Marais .....	\$ 3,125
H. C. Hill & Sons, Inc., Cook .....	3,118
Jet-Ski Company, Inc., Grand Rapids .....	3,550
Nick's Wood Products, Virginia .....	1,095

As in the case of the Durkee Manufacturing Co., Inc., these firms will have the right to bid on the purchase of the equipment upon termination of their contracts.

Only two projects started during the past biennium have failed to materialize to date:

1. Arrowhead Briquet Co., formerly Arrowhead Charcoal Company, Chisholm, has signed a repayment contract for approximately \$37,000. As of July 1, 1964, however, they were not in operation because of lack of Federal ARA funds expected for construction of a briquetting plant to manufacture and package charcoal produced with equipment purchased from the State for this purpose.
2. McCarthy Potato Warehouse, Hibbing, was cancelled because the State failed to receive satisfactory bids to complete the plant with funds appropriated--\$105,000. Robert J. McCarthy, owner of Lake Side Farm, was offered the opportunity to buy or lease equipment purchased for the potato warehouse totaling \$10,191. A final decision on this contract and other equipment purchased for this project had not been determined as of July 1, 1964.

### NEW MAJOR PROJECTS

Ten new major projects were conducted by the department during the past biennium:

1. A total of \$40,000 was appropriated to help start Range area technical vocational training schools. \$10,000 was granted to help pay salaries for instructors for schools in Eveleth, Grand Rapids, Hibbing, and Brainerd.
2. A feasibility study for the Carey Lake Recreation Area Development was carried out jointly by this department, the Housing and Redevelopment Authority of the Town of Stuntz, and the Carey Lake Joint Recreation Commission (Hibbing, Chisholm, Buhl). This was completed at a total cost of \$9,000 the IRR&R appropriated \$6,000 along with personnel and equipment in preparation for the report.
3. Land ownership maps were prepared and printed for 13 Northeastern Minnesota counties. This is the first map of its kind available for this area made possible by the combined mineral research and forestry development personnel of the IRR&R. These maps designate, by color, privately owned land and land under title to the Federal, State or County governments.
4. The first of a series of reports on peat resources of Minnesota was prepared and published in cooperation with the University of Minnesota Institute of Agriculture, Department of Soil Science, Minnesota Agricultural Experiment Station. The IRR&R hopes to continue these publications until a complete inventory of Minnesota's peat deposits has been recorded. This is information that is not available from any other Federal, State, or local agency.
5. During 1964, The Chun King Corporation offered to the IRR&R their Wilderness Valley Farms located at Fens, Minnesota. This property consisting of approximately 500 acres with buildings, materials, and equipment has been appraised at approximately \$250,000. IRR&R was negotiating with the Area Redevelopment Administration and the United States Department of Agriculture to get participating funds to operate this site as an agricultural experiment station with emphasis on research in peat, soil, rice, mushrooms, sod, berries, small fruits and vegetables.
6. Early in 1964, IRR&R submitted an application for a Federal grant under the Economic Opportunity Act of 1964. This is a \$500,000 project with the Federal government's share totaling \$380,000 and the IRR&R share \$120,000. If approved this project would accelerate the forestry development program in cooperation with eleven counties in the Iron Range area.
7. In the fall of 1962 the IRR&R in cooperation with the University of Minnesota School of Mines and Metallurgy, Minnesota Geological Survey, and the Mines Experiment Station applied for an Area Redevelopment Administration technical assistance grant for a \$320,000 project to determine the feasibility of underground mining of Minnesota taconite. The project was rejected early in 1963 by ARA officials in Washington, D. C. Since then, however, Dr. E. W. Davis, known as "Mr. Taconite" prominent in the development of the taconite industry, has urged State and Federal officials to pursue the project. Professor Eugene P. Pfeider of the School of Mines and Metallurgy, University of Minnesota, has also revived the project and recommends that IRR&R seek funds through ARA or other Federal agencies to at least begin the project as recommended in the original ARA proposal.
8. The Minnesota Arrowhead Association received a \$6,000 appropriation to develop a plan for expansion of the travel and resort industry in Northeastern Minnesota.

9. The W. S. Moore Company, Duluth, received an appropriation of \$62,000 to purchase equipment for an ARA iron ore briquetting pilot plant at Gilbert, Minnesota. The ARA's share of the project was \$208,000.

10. Cuyuna Range Minerals Research, Inc., Duluth, received an appropriation of \$15,000 for the first phase of an ARA project for research on Cuyuna Range ores. This paid for the first of a three-phase program. The ARA subsequently appropriated \$81,500 for continuation of the program.

## FORESTRY DIVISION

The Forestry Division of Iron Range Resources and Rehabilitation is currently working on the following projects:

- Forest survey
- County land management
- Forest industry promotion and timber market development
- Applied forest management research

## FOREST SURVEY

The Iron Range Resources and Rehabilitation in cooperation with the Lake States Forest Experiment Station and with various public and private forest agencies completed the field work for the third Minnesota Forest Survey in the spring of 1962. Since then, the activity has concerned the compiling, computing, and summarizing of field data using electronic computers. The results were analyzed and reported in several publications. These include county timber resources reports for Carlton, Cook, Lake, Pine, and St. Louis Counties, as well as a district report for the Lake Superior Unit. These reports summarize the timber resources situation in the five-county block, along with trends and changes between the second and third Forest Survey.

Five Research Notes were published about Timber Harvest, Forest Area Trends, Forest Type Areas, Timber Volume, and Ownership of Commercial Forest Land by counties or groups of counties. The county and unit reports were published by IRR&R and the Research Notes by the Lake States Forest Experiment Station, U.S. Forest Service.

Additional county reports for 12 counties, including Aitkin, Becker, Beltrami, Cass, Clearwater, Crow Wing, Hubbard, Itasca, Lake of the Woods, Mahnomon, Roseau, and Wadena have been written and are being edited for publication early in 1965.

An additional Unit report for nine counties in the Central Pine Unit is under preparation and will also be published in 1965.

The Summary State Report of the Third Forest Survey, presenting an analysis of the Timber Resources in Minnesota, is nearly complete and will be published by the Lake States Forest Experiment Station in 1965.

Numerous requests for timber resources information were received from forest products companies interested in expansion or in studying timber supplies for existing plants. To answer these requests timber resource statistics were assembled for several specific localities, for certain species, and for specific timber sizes. Future forest survey projects include:

1. Calculation during 1965 of new annual growth rates for individual counties and forest types as required by the Minnesota Tree Growth Tax Law.
2. Preparation of generalized forest type maps and generalized forest site quality maps from Forest Survey data for the 18 northern counties.
3. Remeasurement of permanent timber growth plots to determine timber growth and mortality rates, timber quality trends, and the distribution of timber cut.

## COUNTY MANAGEMENT

During the past biennium Iron Range Resources and Rehabilitation stationed professional foresters in Aitkin, Beltrami, Cass, Itasca, Koochiching, and St. Louis counties on a full-time basis, and in Becker, Clearwater, Crow Wing, Hubbard, and Wadena counties part-time. Sales of tax-forfeited land have increased during the past two years in these counties. IRR&R forestry personnel appraised land and timber volume in preparing the county land sales.

Other duties of IRR&R foresters assigned to counties includes supervision of timber cutting and scaling of forest products, reforestation and timber stand improvement. They also compiled timber inventories of tax-forfeited lands for forest management plans and timber cutting budgets.

In the 1962-64 biennium nearly 6,000,000 trees were delivered and planted on county lands; 800 acres were sprayed to control brush prior to planting, over 1,000 acres were furrowed or disked in preparing planting sites, on a total of 300 acres timber stand improvement and thinning of plantation was completed.

A total of 265,000 acres was inventoried for land sale or for forest management purposes. Current County Management projects include timber inventory of 140,000 acres for land sale or managements plans in northern Minnesota and continuation of the above projects to make county lands more productive.

## FOREST INDUSTRY PROMOTION AND TIMBER MARKET DEVELOPMENT

During the past two years the IRR&R has aided Minnesota wood-using industries and individuals in developing the market for timber products, in the following ways: loan assistance, machine procurement and design, plant design or modification, machine design and construction, manufacturing problems, special studies on marketing product design.

These requests have involved the IRR&R consulting personnel in the fields of gluing, charcoal, litter, fiber, treating and preservation, fireproofing, sawmilling, planing, resawing, material handling, wood chips, waste disposal, pallets, corestock, lath, snowfence, novelties, dry kilning, steam-gas and electric power, hydraulics, toys, boxes, crates, cooperage and other packaging, veneer, and other specialized wood products.

Requests included inquiries for sources of various types of lumber, pre-manufacture, sub-manufacturing, relocations of operation in part or full, and special studies. These requests have resulted in studies of white cedar fence posts, treating specifications, litter manufacturing, a sawmill inventory and products output, other primary industry production, pallet lumber manufacturing, freight and shipping problems and costs.

The third forest survey of Minnesota shows species and grades of timber that are underutilized. Finding markets for this available raw material, much of which is of low quality, is of prime economic importance to the Iron Range. Studies of litter production, utilization of aspen, rustic cedar fence manufacturing, have been undertaken by the IRR&R researchers.

Communication between the buyer and seller of wood products is in great need. In order to equip themselves, the Iron Range Resources and Rehabilitation consulting personnel have begun a canvass of all sawmills in northeastern Minnesota. With this information, they can direct wood-using industries to the source of the raw material. Continued work in trying to use the raw material nature has been kind enough to give and continues to give the lands of northeastern Minnesota, is the aim of the Iron Range Resources and Rehabilitation consulting department.

## APPLIED FOREST MANAGEMENT RESEARCH

The Iron Range Resources and Rehabilitation is cooperating with various agencies in their research problems, in addition to several independent department research studies, including the following:

1. Brush Bog Study -- Throughout Northern Minnesota there are 1,828,000 acres classified as lowland brush or lowland grass or 15% of all commercial forest land. These lands once supported commercial stands of timber. The purpose of this study is to explore reforestation technique and machinery to restock these lands and increase their productivity.

Several methods are under study on two areas of approximately four acres each located in Beltrami and Clearwater Counties. These bog areas were furrowed prior to planting. Seedlings were planted in trenches and on furrow slices. Seedlings also were planted on the undisturbed peat to test the effect of furrowing. This test was repeated during spring and fall planting season in both counties.

In a second phase of this study seeds rather than seedlings were planted. Tests were made in 1962, 1963, and 1964 and will be made in 1965 and 1966 in order to determine the success of seeds vs. seedlings, spring vs. fall, furrow planting vs. furrow slice planting.

2. A study of problems related to converting poor aspen stands to coniferous -- Timber poor quality aspen is commonly found on forest land that once supported high grade pine and spruce timber. This study is designed to test planting technique to reestablish coniferous trees. Three aspen stands at three different densities were planted to spruce and balsam fir seedlings with no ground preparation. The success of these plantings is being evaluated.

3. A study of site preparation technique to control sprouting -- To test the effects of disking and furrowing on sprouting of undesirable tree species, 80 plots in Beltrami, Hubbard, Cass and Aitkin Counties were established in 1959. These tests were replicated in both spring and fall. Results so far show that furrowing gives the least sprouting.

4. A study of basal spraying with herbicides -- Basal spraying using chemical herbicides was started in the winter of 1962 in Clearwater, Beltrami, and Hubbard Counties. Several different dosages of chemicals were applied. This experiment will be continued to determine the correct dosages under various conditions to remove the lower quality trees.

5. Direct Seeding -- Tests of direct seeding were made on 144 plots with Red and Jack pine seeds in St. Louis, Hubbard and Beltrami Counties during the spring of 1962. This study is still in progress. This experiment was extended in the fall of 1964 using white spruce and white pine in furrows. Direct seeding, if successful, can reduce reforestation cost and speed the restocking of nonstocked forest land common in northern Minnesota.

Future research projects being planned for the research group are as follows:

1. Visible Cull

A study of cull which can be assessed to a tree by the evaluation of the visible defects. To be used in inventory and management work.

2. Sawmill Study

A time study in various size mills. Residue study (sawdust, slabs, etc.). The purpose of this study will be to determine the optimum crew size, optimum log size by species and to develop a guide to estimating the residue available.

3. Plantation Study

Growth and site studies by species to be used as a guide in selecting sites and species to be planted.

4. Availability and operability of private timber

Timber in private ownership that is offered for sale depends on size of properties, trend in consolidating and fragmentation of ownership, and in owner intention for owning the land. Studies of these factors that influence available timber, will aid users of forest inventory statistics to better evaluate timber supply in their localities.

## MINERAL RESEARCH

### PEAT SURVEY AND SAMPLING

The peat bog sampling program was continued in cooperation with Dr. R. S. Farnham of the Department of Soils, University of Minnesota, St. Paul. Detailed systematic inventories are being conducted of bogs which are selected by aerial photo reconnaissance and exploratory studies.

Notes are taken in the field as to bog vegetation, frequency of roots, other physical characteristics, amount of water present, and preliminary identification of the peat. The samples are then taken to Dr. Farnham in St. Paul for classification and analysis.

The use of the backhoe for sampling has resulted in much better samples for identification and analysis. A visual observation of the peat in place is made and samples are taken to a seven-foot depth. The hand sampler is then used to check the total peat depth and underlying material.

#### BOGS SAMPLED SINCE THE LAST BIENNIAL REPORT\*

	<u>SAMPLES</u>	<u>ACRES</u>
1. Porter Ridge - Koochiching County	109	880
2. Red Lake - Beltrami County	557	6,320
3. Ely Lake - St. Louis County	258	1,360
4. Central Lakes - St. Louis County	346	2,560
5. Fens - St. Louis County	109	1,360
6. Wilderness Valley Farms - St. Louis County	447	3,800
7. Floodwood NW - St. Louis County	271	5,040
8. Floodwood East - St. Louis County	255	1,360
9. Cook - Resampled - St. Louis County	267	1,440
10. Hill City SE - Aitkin County	321	2,880
11. McGregor - Aitkin County	48	480
12. McGregor No. - Aitkin County	49	480
13. McGregor So. - Aitkin County	128	2,080
14. Meadowlands East - St. Louis County	73	960
TOTALS	<u>3,238</u>	<u>31,000</u>

\*Previous bogs sampled are listed in the biennial report of 1960-1962.

In addition to the actual sample holes, many sites were checked for depth and their locations recorded. These will aid in calculating the volume of peat and in planning, in the event of harvesting. Some of the bogs were checked on a preliminary basis with additional sampling to be done after evaluation.

Assistance was given to a peat harvesting company and a company considering operations in the NE Minnesota area. Samples were taken, identified in the field, and furnished to the interested parties.

Dr. Farnham was aided in securing peat samples for radioactive carbon tests in some of the peat research he is doing.

Dr. Farnham reports that the cooperative peat project (IRR&R and University of Minnesota Soil Science Department) was continued during the past biennium. This project involves sampling selected bogs, exploratory studies and laboratory characterization of peats sampled. The Soil Science Department of the University of Minnesota has taken the responsibility of directing the sampling party, analyzing the samples and classification of the peat. In addition some fundamental studies on formation of peat have been continued.

The following analyses from the several bogs sampled have been made. Analyses include pH, % ash content, % water-holding capacity, and classification:

West Central Lakes Bog:	677	complete
Rerun Cook Bog:	267	"
Red Lake Bog:	557	"
St. Louis Co. Peat Co.:	231	"
Ely Lake Bog:	258	"
Peat Freezing Expt:	104	"
Central Lakes Bog:	250	(incomplete)
Wilderness Valley:		(In progress)

One report on inventory of peat resources has been completed and published. (Oct. 1964). This one was for the West Central Lakes Bog. Two other reports are in preparation (Cook and Red Lake Bogs) and others are expected to be completed soon. In addition a general bulletin on peat resources (nature, properties, and distribution) is completed but has not been published.

The fundamental studies on nature and formation of peat have been made in five bogs across northern Minnesota. These include the Red Lake Bog in Beltrami County, the Pine Island Bog in Koochiching County, Myrtle Lake Bog in Koochiching County, Cook Bog in St. Louis County and the Isabella Bog in Lake County.

Four radio carbon dates were obtained from sphagnum peat bogs in four different locations to find out when sphagnum began to accumulate in the bogs of Minnesota. Dates of from 2000 to 2400 years before present were obtained which indicates these deposits are accumulating rapidly. It takes only 200 to 240 years for a foot of peat to form according to this data.

Topographic maps were made of four raised bogs and samples collected for detailed analyses to properly characterize the peat and learn something about the formation and distribution of bogs.

## WATER DRILLING

### City of Gilbert

As a result of favorable results in the location of new water supplies for the cities of Aurora and Chisholm, a request was received from the city of Gilbert for aid in the location of a new supply area.

The area of the present water treatment plant was investigated and three test wells were drilled. Pumping tests were made, the water tested, and the results evaluated. An ample supply seemed to exist but a hardness problem was encountered.

In search of a more suitable supply, a test well was drilled near the shore of Ely Lake. A new supply was found that would require much less treatment. Again pumping tests were made and the State Board of Health was consulted as to the location and the quality of water. Having found a promising source of water, the project was terminated.

A map showing the present water treatment plant, location of the test wells, and elevations was made up along with a cross section of the test wells. These were supplied to the City of Gilbert to be used in the planning of a new water supply.

### Cook Golf Course

A request was received from the Cook area where an ARA project had been approved for development of a golf course and recreation area.

The auger drill was used in checking the amount of surface and in search of a supply of water. After ten holes and 550 feet of drilling, an artesian well was encountered. This is presently being checked by a hole 95 feet deep, with the water to be checked for quantity and quality.

### LAND OWNERSHIP MAPS

(See page 13)

A land ownership map program was started near the end of the last biennium. Maps of the northern counties are being prepared in color, showing state, county, federal and private lands. These are available through the Hibbing and St. Paul offices of the IRR&R and have been found very useful by many agencies and individuals.

Counties available at this time:

Aitkin County	Itasca County
Beltrami County	Koochiching County
Carlton County	Lake County
Cass County	Pine County
Cook County	St. Louis County
Crow Wing County	

At the printers - (Available in the near future):

Becker County  
Wadena County

### TOPOGRAPHIC MAPS

By providing matching funds, IRR&R participated in the topographic mapping program with the U.S. Geological Survey from 1949 to 1962. Because of lack of funds, the IRR&R financial participation was suspended as of June 30, 1962.

Prior to 1949, Minnesota ranked last among the states in percentage of area covered by standard quadrangle topographic maps. As a result of the State and IRR&R participation, the coverage has greatly increased, but is still far behind the national average.

In 1963, the cooperative mapping program was reactivated with funds approved by the Legislature from the Omnibus Natural Resources Act. Preference was given to the quadrangles that had been started with IRR&R funds but had been suspended.

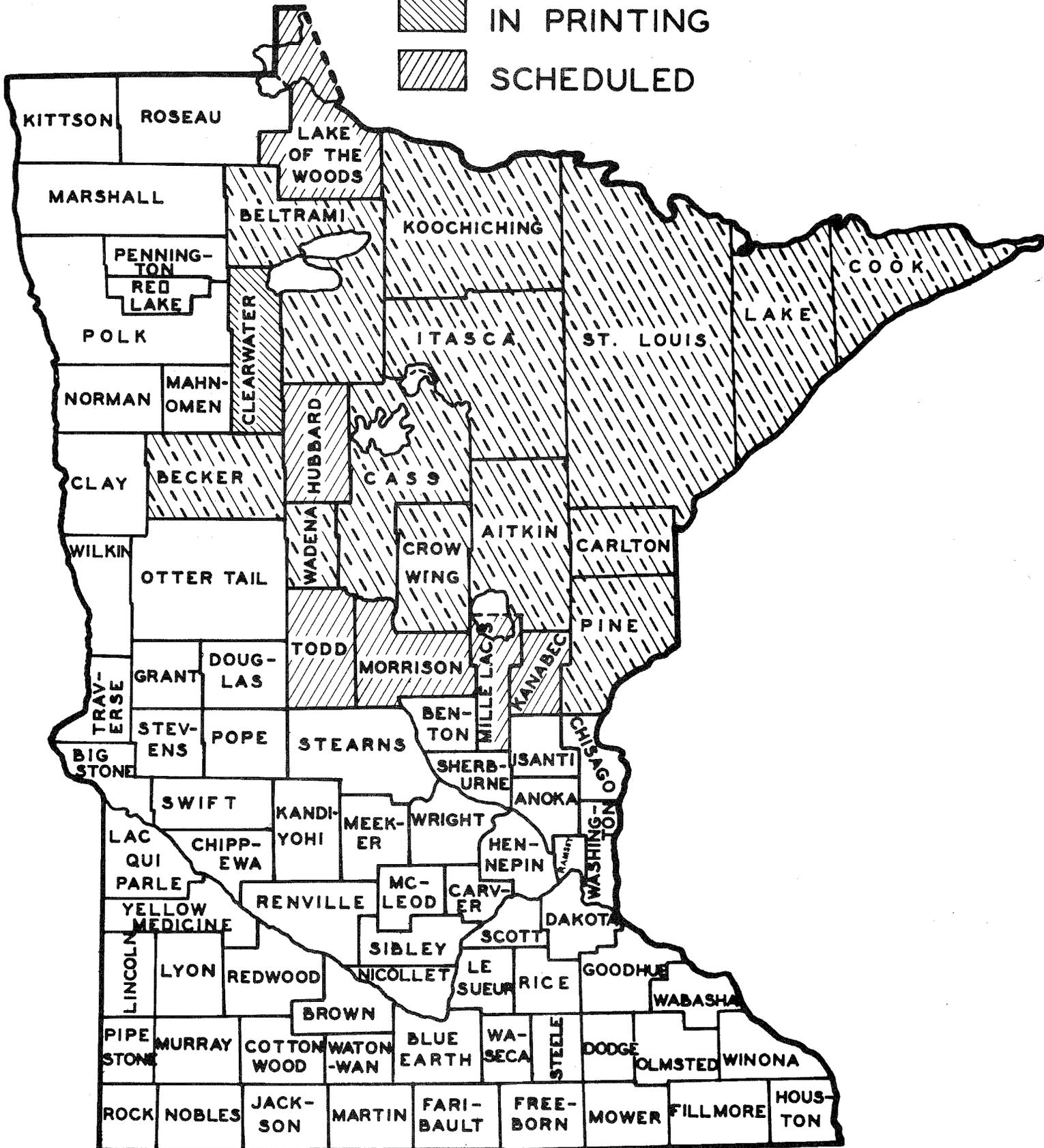
In March, 1964, an accelerated 10-year mapping program was proposed that would result in complete coverage of the State. This was approved with the funds from the Minnesota Outdoor Recreation Resources Commission, a result of the Omnibus Natural Resources Act.

Although the IRR&R does not presently participate in the program financially, the department is still represented on the Mapping Advisory Board and has a vote on the future mapping proposals.

A perpetual inventory of the topographic maps that cover the northern part of Minnesota is maintained in the offices in Hibbing. These are available to public and governmental agencies. A record of mapping progress and availability is also maintained and assistance is available to interested parties. A master file of all U.S.G.S. maps published for the state, is kept in the office of the Commissioner, Room 60, State Office Building, St. Paul, Minnesota 55101.

# OWNERSHIP MAPS PROGRESS

-  COMPLETED
-  IN PRINTING
-  SCHEDULED



## SURVEYS

### Potato Warehouse

A survey was made of part of the McCarthy Farm at Chisholm to get the location of the existing structures and the elevations of the area. A map was made up to be used in the planning and building of the potato warehouse on this site.

### Multiply Plant

In an effort to reduce the land owned, a survey was made locating the property presently being used at the plant site of Multiply Incorp. of Virginia. Maps were prepared and submitted showing the area owned and land in use in relation to adjoining property.

### Deer River Co-op Wild Rice Plant

A request was received from a newly formed cooperative at Deer River to locate and stake out the property acquired for a plant site. Property lines were located and the terrain checked. A map of the area, showing the location and elevations, was prepared and submitted as an aid in planning a building site and land layout.

### Olaf Vang Property

A magnetic survey was run on property near Deerwood, SE SW, Sec. 32, T. 46N, R. 28W. Approximately 1/2 mile of magnetics were run to check for an anomalie. A cross-section, which did not indicate any anomalie, was made up and presented to the property owner.

### Carey Lake

In cooperation with the Forestry Division of the IRR&R, maps of possible land exchange sites were prepared for the Carey Lake Development Commission, which is planning a recreation area on the land now owned by the DuPont Company. These show location, ownership, water availability, roads, railroads, and some topography on the public lands that would be exchanged if satisfactory to both parties.

## FARM MANAGEMENT

During the past biennium the IRR&R has conducted the Farm Management Program for Northeastern Minnesota. This has been accomplished through close cooperation with the Minnesota Department of Education, Vocational Division; the University of Minnesota, Institute of Agriculture and the Area Vocational-Technical Institute in Duluth. Supervisory duties have been performed by the Area Vo-Ag Coordinator of the school.

This program has been in existence in Northeastern Minnesota since 1956.

Reports have been sponsored by IRR&R in 1956, 1957, 1958, 1959, 1961, 1962, 1963 and 1964. The 1960 study was not sponsored by IRR&R, but a report was published by the Duluth Area Vocational-Technical Institute on a limited basis. In this year when IRR&R funds were not available, the number of cooperating farmers dropped down to one-third of normal participation.

Below is listed the participation by counties in 1962 and 1963:

1962 Record -- Printed in 1963: 12 vo-ag teachers cooperating in 9 counties.

Becker	1	Hubbard	8
Beltrami	4	Koochiching	11
Carlton	1	Pine	1
Cass	2	St. Louis	4
Todd	13	Total	45

1963 Record -- Printed in 1964: 12 vo-ag teachers and two county agents in 10 counties cooperating.

Becker	3	Lake of the Woods	2
Beltrami	4	Pine	3
Cass	9	St. Louis	5
Hubbard	12	Todd	24
Koochiching	6	Wadena	2
		Total	70

Without the support of the IRR&R many farmers in this area would not be able to participate in this most important program. Successful farmers everywhere are realizing more and more the value of complete records and the need for positive decision making made possible by the analysis reports.

As analysis meetings and account book closing meetings are held throughout the area periodically, it is noticed that much interest is being generated, particularly on a family basis. Many wives and sons are taking a real interest in the farm operation. This was very evident in the Staples area where we had 15 books from the Farm Management Program under the Manpower Development Training Act. Letters of appreciation were received by the Department from many of these farm families.

Outstanding farm families on the program are honored each year at the Agricultural Council of the Duluth Chamber of Commerce. This award program was begun in 1963, with Minnesota Power & Light Co. sponsoring the award. The winning families were as follows:

1962 Record -- Leo and Margaret Jansen, Staples  
 1963 Record -- L. R. and V. R. Johnson, Meadowlands

## U. S. G. WATER SURVEY

During the biennium July 1, 1962 through June 30, 1964, the following gaging stations were operated in this program:

Embarrass River at Embarrass  
Pike River near Embarrass  
Stony River near Isabella  
Sturgeon River near Chisholm  
Swan River near Warba

Records of streamflow obtained at these gaging stations have provided valuable information concerning the availability of water resources on the Iron Range.

The three stations on Embarrass, Sturgeon and Swan Rivers are classified as primary stations and they are intended to form an integral and important part of the areal hydrologic network of the State. They should be operated permanently to obtain a long-range time sample of the hydrology of the area in which they are located. If a number of primary stations are maintained, the hydrologic network of the State can be considerably expanded on a long-term basis by correlating records from short-term secondary stations with the records from the primary stations.

The increasing emphasis on taconite developments enhances the importance of the continued operation of the gaging stations on the Iron Range - particularly the primary stations.

There have been many requests for stream-flow data collected at the five gaging stations in question. As an example the collected data have been used by Mr. Douglas Barr of Minneapolis in his consulting engineering work for Erie Mining Co., and M. A. Hanna Co. Mr. Barr has stated that he feels the continuation of all five stations is vital for the intelligent planning and development of projects on the Iron Range.

Cooperative financing for these stations had been provided through June 30, 1964, by the Department of Iron Range Resources and Rehabilitation and for the quarter July 1 to September 30, 1964, by Minnesota Division of Waters.

## GREAT RIVER LUMBER COMPANY

Deer River, Minnesota

During the past biennium Minnesota Veneer and Plywood, Inc., with James K. Campbell of Manchester Industries, Inc., Manchester, Iowa, President, operated the State's wood processing plant at Deer River, Minnesota. This project was originally started in 1948 and has been operating off and on since then under several different contract terms.

In the spring of 1964, negotiations with Great River Lumber Company were started when residents of Grand Rapids indicated an interest in getting a new operator for the plant. Minnesota Veneer and Plywood, Inc. had defaulted in payments and was very inefficient and unreliable in its operations and living up to its contract terms. In March, 1964, officials of the Great River Lumber Company, Benhart Rajala, President, appeared before the IRR&R Commission and offered to take over the plant on a lease-purchase contract. Their plan was to use the Deer River plant as a concentration and initial processing point for lumber destined for the Tioga cutup plant, for veneer and for other wood products using the lower grades of hardwood lumber.

Because of legal complications resulting from termination of the Minnesota Veneer and Plywood, Inc. contract, and the liens and mortgages applied on personal property owned by that firm but located within the plant, a repayment contract between Great River Lumber Company and the State of Minnesota was delayed until January of 1965. In the meantime, however, Great River Lumber Company occupied the plant, improved and reconditioned the building, machinery, and equipment, and is using the facility in cooperation with their original factory at Tioga where the firm produces wood blanks for furniture and cabinet manufacturers from kiln dry aspen and basswood lumber and other hardwoods. The lumber is purchased from sawmills in a ten-county area adjacent to Grand Rapids. This use provides many small producers with a market for their lumber. As of July 1, 1964, there were 14 employees with the firm.

## RUSTIC FENCE, INC.

Northome, Minnesota

In 1961, IRR&R appropriated \$55,000 for the construction of a plant to manufacture cedar fence posts at Northome, Minnesota. Mr. D. D. South of Arlington, Texas, with whom the State entered into a contract for operation of the plant, refinanced the operation in 1963. The name was changed to Rustic Fence, Inc., with Max J. Unger of Northome, Minnesota, Manager.

Rustic Fence, Inc. took over the plant, has been operating continuously, employing from 8 to 12 persons in the plant and from 8 to 20 peelers in the yard, along with one office secretary. The firm purchased approximately \$50,000 worth of cedar posts from persons in the area where the plant is located. Officials of the new firm indicate that they will be able to increase activity considerably during the next biennium and have been current in their monthly payments on the original contract.

## CUYUNA RANGE MINERALS RESEARCH, INC.

Duluth, Minnesota

Cuyuna Range Minerals Research, Inc. was formed for the purpose of determining the feasibility of processing Cuyuna Range iron ores in a large commercial operation. The firm determined that it is necessary to upgrade the Cuyuna ores by processing, similar to that used in the taconite industry elsewhere in the State.

An application was made for a technical assistance grant through the Area Redevelopment Administration with participating funds by the IRR&R. In November, 1963, the IRR&R Commission appropriated \$15,000 for the first phase of the program. Samples of Cuyuna ore were collected, prepared, mixed and placed in storage. Portions of material from each of the sampling areas and also of each of the composite samples were sent to the Allis-Chalmers Manufacturing Company in Milwaukee for laboratory tests. These tests did indicate in a preliminary way how each of these materials would respond to beneficiation. This was the first well-planned sampling effort ever made on the Cuyuna. The composite samples were representative of three types of crude raw material that could be supplied in large quantity for a future commercial processing plant on the Cuyuna.

In spring of 1964, the ARA approved a three-phase contract of study by Allis-Chalmers Manufacturing Company of Milwaukee. They have been supplied with samples for their initial testing program and when additional material is needed they will be supplied with further shipments of similar material collected under the IRR&R project.

In addition to the \$15,000 appropriated by the IRR&R, the ARA subsequently appropriated \$81,500 for completion of the project which is still underway.

## NU-PLY CORPORATION

Bemidji, Minnesota

The Nu-Ply Corporation of Bemidji, Minnesota, is the most successful of the present IRR&R projects in operation. It will probably rate along with The Chun King Corporation and Superwood Corporation, both of Duluth, Minnesota, as among the most outstanding industries promoted with IRR&R funds.

Negotiations for the plant were started in 1953. The firm had considerable trouble in its early years and required legislative relief in the form of a moratorium because of lack of funds. In 1961 officials of the firm indicated that unless they were given additional financial relief or aid they would not be able to continue operation. The Commissioner at that time recommended a revised repayment schedule which reduced considerably the monthly payments to the State and thereby released funds for operating capital for the firm.

As a result, the plant has been extremely successful ever since and today has a payroll of 70 full time men in the plant and 35 workers employed as cutters and haulers. During the past biennium Nu-Ply Corporation operated on a three-shift, seven-day per week basis with only eight hours of this constituting maintenance down time and with two weeks a year out for vacations.

It is noteworthy that only 15 percent of the sales are for use in Minnesota, and that 80 percent of all expenditures are made within the State of which 70 percent is in Bemidji. Expenditures at local hotels, motels, and eating places by people who do business with Nu-Ply Corporation, and a considerable volume of air travel, are some of the additional benefits of this operation.

Several improvements have been made at the plant with the consent and approval of the IRR&R Commission, increasing the capacity and improving the quality of the product. A shipping warehouse 80 x 180 feet was constructed to permit loading railroad cars and trucks under cover and to permit assembly of orders for shipping. A complete new "debarking and chipping system" has been engineered and is in the process of construction. New plans call for increasing capacity by another 30 percent during the coming year.

Nu-Ply Corporation has remained current in its payments to the State of Minnesota and the original total of \$350,000 has been reduced by payments to \$165,875 as of September 30, 1964.

## MINNESOTA ARROWHEAD ASSOCIATION

Duluth, Minnesota

In the spring of 1962, IRR&R appropriated \$5,000 to the Minnesota Arrowhead Association for continuation of a tourist industry survey financed by this department in 1958 with a \$50,000 grant for a complete survey of the tourist and travel facilities in Northeastern Minnesota.

An additional \$1,000 grant was requested in the spring of 1964 to complete the project. The purpose of this follow-up survey was to provide current information on trends, economic facts, and to develop a plan for expansion of the travel industry in the State of Minnesota. The M.A.A. proposed to put into motion, collectively with the business and resort people, a "plan of action" designed to strengthen our economy, bring in additional business to already established firms, and further develop the travel industry to its highest potential. The M.A.A. prepared pertinent and statistical information that demonstrated, beyond any reasonable doubt, the tremendous impact the tourist and travel industry has on the economy of our 19-county area.

Selling the program to selected community leaders and later to the entire business community in respective areas throughout the 19-county-wide area was essential. The M.A.A. presented a complete breakdown of economic facts as they affected the whole 19-county area, and then likewise, as they affected the local community where the meeting was held. The presentations included documented material, such as, retail sales and the percentage of total sales applicable to travel, purchasing power, additional employment, how much was spent locally on food, lodging, service stations, and other retail outlets.

A 36-page report outlining typical examples of the "Economic Impact Story" was prepared and presented to the IRR&R Commission. A limited number of copies of this report are available at the offices of the IRR&R.

## MINNESOTA P & O MFG. CO., INC.

Virginia, Minnesota

In March, 1964, the Commissioner recommended an appropriation of \$75,000 for the purpose of obtaining equipment and machinery for the manufacture of wooden component parts used in artificial limbs. The Minnesota Prosthetic and Orthotic Mfg. Co., Inc., a subsidiary of the United States Manufacturing Co., Glendale, California,

one of the world's largest manufacturers of artificial limbs, had obtained a lease for rental of the abandoned State Highway Department building in Virginia, Minnesota, as a plant site for this operation.

According to J. Morgan Greene, President, the aspen timber of which there is an unlimited supply in this area has been determined as very desirable for the manufacture of artificial limbs. He indicated at a meeting before the IRR&R Commission that the Virginia plant could develop into the major source of supply of wooden component parts for the factory in California which produces the finished product for a worldwide market including connections with the Veterans Administration hospitals in this country.

If the temporary operation is successful, the firm will consider constructing a permanent building and greatly increasing production. On June 1, 1964, the firm took over the building and began installing equipment and by June 15 started limited production. As with any new firm, Minnesota P & O Mfg. Co. had some problems with production methods and raw materials. Mr. Benedict M. Erchul, General Manager, stated that it would take from 60 to 90 days to get the plant in good operating condition. By July 1, 1964, six persons were employed in the plant which was using approximately 8,000 board feet of aspen lumber per month purchased from loggers in the area. Mr. Erchul estimated that within 90 days employment would increase to 15 men and the plant would use approximately 25,000 board feet per month. Officials of the California firm report that the products are of superior quality and that they were well pleased with the results of the operation at that time.

### MESABI GROW COMPANY, INC.

Central Lakes, Minnesota

A fire in March, 1964, which destroyed the Mesabi Grow Company's packaging plant at Cotton, Minnesota, interrupted a busy work schedule for the firm which was filling orders for a record shipment of peat for the coming spring and summer gardening market. The plant had started operations in 1962 with equipment purchased with an IRR&R appropriation and had shipped a record 90 carloads of peat in 1963, almost double the 1962 season's output. Equipment owned by the State of Minnesota damaged by the fire was covered by insurance and the IRR&R was reimbursed for the loss.

Following the fire, the operators moved their packaging division to Central Lakes, Minnesota, and continued processing and packaging at the plant site erected by the firm the year before. Much of the State-owned equipment under lease to Mesabi Grow Company was located at the Central Lakes plant at the time of the fire.

During the biennium, Mesabi Grow Company shipped approximately 150 carloads of peat, averaging 50 tons per carload, totaling more than 7,500 tons. Shipments were made to the Twin Cities area and ten other states including Arizona, California, Colorado, Indiana, Illinois, Iowa, Kansas, Ohio, North Dakota, and Texas. This is significant considering the fact that in 1960 total peat production for the entire State of Minnesota was only 1,465 tons.

An average of seven persons are employed at the packaging and processing plant and from two to five men in the peat fields, making a total of from 9 to 12 full time workers in addition to part time clerical workers employed in the business offices in Virginia and one full time sales manager.

### W. S. MOORE COMPANY

Gilbert, Minnesota

Late in 1962 the IRR&R Commission approved a \$52,000 appropriation for a project to be conducted by the W. S. Moore Company of Duluth to operate a pilot plant as a non-profit experimental project to manufacture iron ore fines into briquets to be competitive and marketable on the iron ore market. This appropriation was contingent upon a \$208,000 appropriation of Area Redevelopment Administration funds for the complete project which would provide information as to the technical and economical feasibility of this process using ore fines from the Vermillion, Mesabi, and Cuyuna Ranges.

W. S. Moore, President of the W. S. Moore Company, stated that if this research project indicates the feasibility of this process, it would be possible to construct a commercial facility producing 300,000 to 500,000 tons of iron ore briquets a year in the northeastern Minnesota area. Mr. Moore stated that there is a great abundance of iron ore fines in the area which have no commercial value in their present condition.

In October, 1962, a progress report was submitted indicating plans were complete for construction of a basic briquetting plant on the W. S. Moore Company property at the site of the Mariska Mine near Gilbert. Plant operations started in April 1963 with a plant engineer, four operating foremen, and four helpers, providing continuous operation five days a week. There were two objectives: (1) To determine whether iron ore briquets suitable as a blast furnace feed can be produced from Minnesota fine iron ore concentrates. (2) To determine the cost of briquetting press maintenance; this being the basic unknown in projecting briquetting costs.

A plant having a nominal capacity of 4 L.T.P.H. was constructed and a production goal of 10,000 tons of briquets was established. The final report concludes that press maintenance costs were prohibitive. Roll insert wear alone cannot be projected lower than \$1.50 per ton of briquets for a commercial installation. The briquet quality, as measured by standard A.S.T.M., 200 revolutions, tumble tests, was substantially inferior to that of iron ore pellets.

Because of high maintenance and repair costs and associated low production rates, only 1600 tons of briquets were produced which is far short of the tonnage required for a blast furnace test. There remained no justification for a furnace test, even if one could be made on a small tonnage of briquets.

The final report submitted in June, 1964, determined that the project was not feasible and the contract was terminated. Under provisions of the contract the State-owned equipment reverts back to the IRR&R. Equipment purchased with Federal funds reverts back to the Area Redevelopment Administration. The ARA will get the receipts of the sale of the 1600 tons of briquets produced.

The Commissioner of IRR&R was authorized to cooperate with the ARA in an effort to get someone else to continue with experimental operation of the plant. If this is not possible, the plant will be dismantled and sold. Receipts from the sale of State-owned equipment will be credited to the IRR&R revolving fund and ARA receipts will be credited to the Federal government.

### **DULUTH FILTER COMPANY**

Duluth, Minnesota

The Duluth Filter Company manufactures filter cartridges for diesel machinery. The manufacture of replacement cartridges and filtration equipment is international in scope. There is an approximate excess of \$250,000,000 spent annually on industrial filtration. It is estimated that 80 percent of the total figure spent for filtration equipment is required for replacement cartridges; 20 percent is spent for the original equipment.

The basic material in the filter cartridge is Minnesota jackpine fibers, presently manufactured at the Floodwood plant of the Superwood Corporation of Duluth.

An increase in production by Duluth Filter Company will provide a market for woodcutters in the Duluth area utilizing some of the vast reserve of jackpine of Northeastern Minnesota.

The Duluth firm has used \$30,000 of the \$50,000 appropriated for this project in 1962 for equipment for its plant located at 4230 West Second St., Duluth, Minnesota. John C. Sorenson, Vice President, reports that Duluth Filter Company has provided products for firms in Maryland, Ohio, Iowa, Missouri, Illinois, Michigan, and South Dakota, as well as many communities in Minnesota, especially in the mining area in Northeastern Minnesota. The plant employs from six to ten people, but with the additional machinery purchased with IRR&R funds the operation is expected to expand and will require more employees and raw material from the Duluth area.

### **MULTIPLY OF VIRGINIA, INC.**

Virginia, Minnesota

The Multiply plant at Virginia, Minnesota, constructed in 1959 at a cost of \$600,000, was destroyed by fire in March of 1961 and immediately reconstructed with insurance funds. In less than a year of operation, however, the firm reported the product was not marketable. After considerable experimenting and research, officials of the firm decided that this product could not compete on the market.

They indicated the present machinery was obsolete and along with depreciation, the cost of the plant should be reduced more than 50 percent. The IRR&R Commission, however, decided to call in an industrial engineering firm, John Le Vin Associates of St. Paul, to make a thorough appraisal of the plant and equipment. It was the determination of this firm that the plant and equipment was not obsolete and could be converted to manufacture products that would be marketable. They estimated the plant value in excess of the original \$600,000 investment.

Based on this report, the IRR&R entered into a new contract with Superwood Corporation, Duluth, Minnesota, which was willing to accept the Le Vin appraisal figures. Superwood Corp. plans to convert the plant from the manufacture of construction board into 16-foot siding, which has a definite profitable market.

At the end of the fiscal year they were in the process of removing the original equipment and installing new machinery at no additional cost to the State. The repayment schedule provides for a nominal rental fee for six months, followed by a rental based on a percentage of monthly sales.

## AREA VOCATIONAL TECHNICAL SCHOOLS

The IRR&R provided a total of \$40,000 in grants to help the establishment of area vocational technical schools in Brainerd, Eveleth, Grand Rapids, and Hibbing. A contract for \$10,000 was entered into between each School District and the State, the funds to be used to pay fifty percent of the salaries of instructors for one year.

### Brainerd Area Vocational Technical School

Five different programs were offered at the Brainerd school including Dental Assisting, Practical Nursing, Retail Floristry, Secretarial Science, and Junior Accounting. A total of 85 students were enrolled in these courses when the program started in September of 1964, with 8 instructors employed for the program.

Elliot Woolery, Superintendent, reports that the School Board is presently planning a new building for the Area Vocational School to provide more adequate facilities for an increased program.

### Eveleth Area Vocational Technical School

The Eveleth Area Vocational Technical School offered courses in Auto Mechanics, Graphic Arts, and Welding the first year. They added courses in Office Education and Optical Technology the second year. A limited program was also conducted in night adult classes in Welding, Photo-Lithography and Auto Mechanics for Women.

A total of 116 students were enrolled in classes during the past two years. An enrollment increase of 100% was reported for the 1964-65 school year according to Robert E. Bergstrom, Director.

### Grand Rapids Area Vocational Technical School

The Grand Rapids Area Vocational Technical School started with classes in the Fall of 1963. The IRR&R grant was used for paying salaries of instructors for the first year of operation. Courses were offered in Clerical, Stenographic, Medical Secretary, and Junior Accounting classes in the Office Education Department. Other classes were held in Welding, Appliance Repair, and Practical Nursing.

A total of 71 students were enrolled in these classes as of June 30, 1964 according to Leo Keskinen, Director.

### Hibbing Area Technical Institute

The Hibbing Area Technical Institute was the first to receive financial aid from the IRR&R. Three initial courses were started in September, 1962, including Electronic Data Processing, Medical Laboratory Assistant, and Auto Mechanics.

William E. Magajna, Director, reported a total of 74 students in the first three classes. The evening extension enrollment from July through December, 1963, totaled 373 students in 27 separate classes and sections. In less than a year's time, 440 people have utilized this facility.

\* \* \*

Officials of all four schools have expressed appreciation to the Commissioner and the IRR&R Commission for having the foresight to provide these School Districts with the \$10,000 grants to aid in establishment of these institutions.

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## RECEIPTS, TRANSFERS, AND EXPENDITURES

RECEIPTS:	<u>1962-1963</u>	<u>1963-1964</u>
Balance brought forward July 1	\$ 1,057,993.10	\$ 799,912.37
Receipts from IRR&R Revolving Fund	25,886.20	32,515.51
Misc. refunds from prior years' expenditures	3.33	424.70
Total Receipts -----	<u>\$ 1,083,882.63</u>	<u>\$ 832,852.58</u>
<b>EXPENDITURES:</b>		
Transfers Out (By Legislative Action):		
University of Minnesota (Beneficiation of low-grade ores)	165,000.00	190,298.00
Commission on Taxation & Production of Iron Ore	25,000.00	-
Dept. of Administration (Utilities)	-	172.00
Occup. tax refund due to overpayment in prior year	-	101.66
Total Transfers Out -----	<u>\$ 190,000.00</u>	<u>\$ 190,571.66</u>
Projects:		
Administration	75,685.04	76,385.70
Agriculture:		
Farm Management & Accounting	1,131.40	2,220.25
Land Clearing Machine Operator's Salary	646.02	1,698.74
St. Louis County Conservation Needs Report	-	431.20
St. Louis County Dairy Herd Improvement (salaries)	1,648.64	1,848.00
Area Technical Vocational Training Schools	9,326.03	30,000.00
Arrowhead Charcoal Co.	42,236.65	-
Carey Lake Recreational Area Survey	-	6,000.00
Cedar Fence Plant, Northome, Minn. (Rustic Fence, Inc.)	5,196.90	-
Commission on Taxation & Production of Iron Ore	10,742.68	-
Crow Wing Charcoal Co.	85.13	-
Cuyuna Range Minerals Research, Inc.	-	14,313.89
Deer River Woodprocessing Plant	-	36.57
Duluth Filter Company	14,768.91	11,005.69
Forestry Development:		
Forest survey, county management, research, consulting, marketing, county development, farm forestry education	159,611.27	162,719.76
Cooperative County Land Development (Section Corner Post Relocation)	48,562.13	51,921.19
Misc. Work Projects	49,327.59	73,321.03
Iron Range Planning Commission	15,000.00	-
Kimball & Sons Co., Hill City, Minn.	37,659.94	236.98
Maple Syrup Plant, Grand Portage, Minn.	3.39	157.62
McCarthy Potato Warehouse	4,442.30	172.67
Mesabi Deep Hole Drilling	2,908.15	-
Mesabi Grow Co., Inc., Central Lakes, Minn.	26,509.23	6,505.98
Mineral Research:		
Peat bog sampling, water drilling, clay sampling	52,866.03	42,201.01
Minnesota P & Q Mfg. Co., Inc.	-	72,978.54
Moore, W. S., Briquetting Plant	51,801.16	-
Multiply Plant (appraisal)	-	3,051.22
Peat Research (Univ. of Minnesota)	16,000.00	614.64
Strategic-Udy Direct Reduction Process	2,531.00	-
Typha Products, Inc., Northome, Minn.	4,194.00	440.97
Water Survey (U.S. Geological Survey)	24,970.66	3,000.00
Total Project Expenditures -----	<u>\$ 657,854.25</u>	<u>\$ 561,261.65</u>
Total Transfers Out and Project Expenditures	<u>\$ 847,854.25</u>	<u>\$ 751,833.31</u>
Balance June 30 -----	236,028.38	81,019.27
Receipts from 10% of Occupational Tax on Iron Ore credited to General Revenue Fund, June 30 -----	<u>563,883.99</u>	<u>555,749.37</u>
Brought Forward July 1 -----	<u>\$ 799,912.37</u>	<u>\$ 636,768.64</u>
Transfer Out to University of Minnesota for year 1964-65 -----		<u>(197,686.00)</u>
Total amount available for expenditure for year 1964-65 -----		<u>\$ 439,082.64</u>

ORGANIZATION CHART

1962-1964

DEPARTMENT OF IRON RANGE RESOURCES & REHABILITATION

MINNESOTA STATUTES, SECTION 298.22

