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## A Land Utilization Survey of the Turtle Mountain Indian Reservation, Belcourt, North Dakota

Kenneth D. Jensen

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A LAND UTILIZATION SURVEY  
OF THE TURTLE MOUNTAIN INDIAN RESERVATION,  
BELCOURT, NORTH DAKOTA

by

Kenneth D. Jensen

A. B. in Social Science, Chico State College,

Chico, California 1963

A thesis

Submitted to the Faculty

of the

University of North Dakota

in partial fulfillment of the requirements

for the Degree of

Master of Arts

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This thesis submitted by Kenneth D. Jensen in partial fulfillment of the requirements for the Degree of Master of Arts in the University of North Dakota is hereby approved by the Committee under whom the work has been done.

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Kenneth D. Jensen

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## CHAPTER I

### INTRODUCTION

#### Definition of the Problem

The Turtle Mountain Indian Reservation was officially established in approximately its present size in 1904. Since its establishment the reservation has been a persistent problem area in which the problem has been one of too many people on too little land.<sup>1</sup> The problem is further intensified by the fact that the entire area is made up of low hills, covered for the most part by small trees and brush, and dotted with many potholes and small lakes. The problem is getting worse instead of better. Seasonal employment has almost vanished because of farm mechanization. Construction projects are limited in number and are of short duration due to the long severe winter. The estimated family median income is \$1,500 per unit, with an average of 5.6 persons per family unit.<sup>2</sup> This is well below the national average. Current figures reveal as high as \$1,500,000 being required for welfare assistance and services during the year. Estimates run near 85 per cent of the Indian population requiring relief during the winter months. Population is increasing, while in adjacent areas of the state the size of economically viable land holdings are increasing.

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<sup>1</sup>A population in excess of 6,000 Indians lives on approximately 71,080 acres.

<sup>2</sup>Interview with Val McBroom, Resources Development Officer, Turtle Mountain Indian Agency, Belcourt, North Dakota, July 14, 1964

All indications suggest that even the small amount of land available per person is not being used to best advantage. Information is needed to determine where, how, and to what extent land use may be said to be adequate or inadequate.

#### Methodology

The study used the unit area system of mapping land use and physical features. Aerial photographs, scaling eight inches to the mile, served as the base for all field mapping. The system as used in the Turtle Mountain Reservation is a modification of similar schemes used in such well-known projects as the land classification of the Tennessee Valley Authority and the rural land use classification of Puerto Rico.

The classification code is included as Appendix I of this study. It will be noted that digits will be used in fractional form to represent the cultural and physical features of the landscape. The numerator indicates cultural or man induced features of the landscape, while the denominator indicates physical or natural features of the landscape. Thus the complete fractional code provides an effective method of summarizing the relationship between physical and cultural features. Every plot of land is fractionally coded on maps of the entire area. The maps are included as Appendix III. In addition, the location and concentration of wild fruit has been coded as an initial step for future utilization.

#### Application

The principal objective of this study is to provide an inventory of the use of Indian land in Rolette County, North Dakota, the

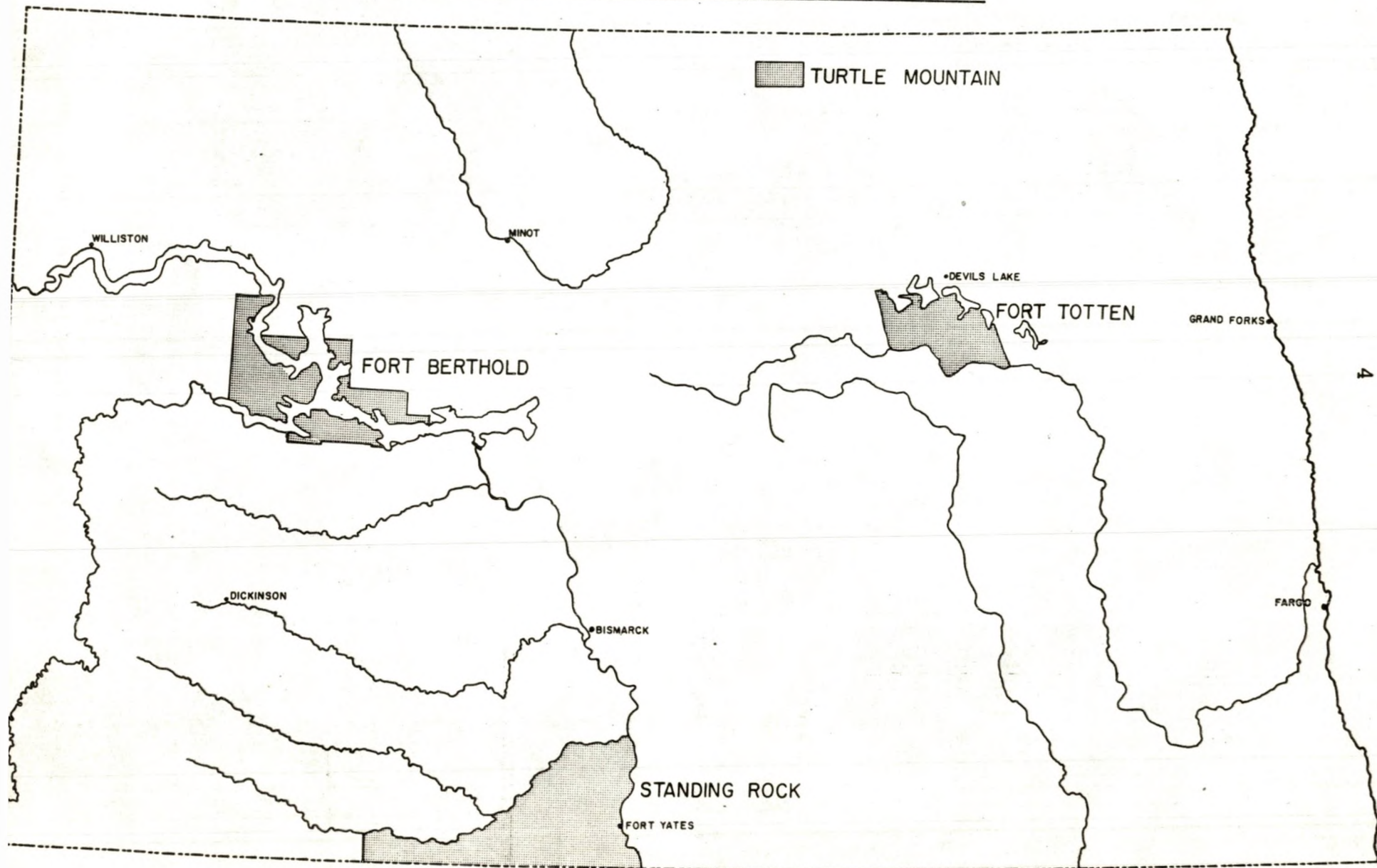
inventory being a primary prerequisite to effective future development.

The base of the study is the land utilization mapping of the entire area. Data for single purpose maps can be readily extracted from the mapped fractional summary which is included as Appendix III. In addition, tabular summaries of the land in various classes are provided as well as a general interpretation of the inventory.

Steady effective development of an area requires the most complete knowledge possible of both the assets and deficits that will be encountered. It is hoped that ultimately this study will lead to planning for maximum efficiency of use.

This particular paper will deal with the two townships comprising the reservation proper. The author's colleague, Mr. Tony Kuz, is compiling the material on the Indian land holdings outside the reservation boundary.

Fig. 1 INDIAN RESERVATIONS OF NORTH DAKOTA



( Map by Duane L. Younggren)

## CHAPTER II

### PHYSICAL GEOGRAPHY OF THE TURTLE MOUNTAIN INDIAN RESERVATION

#### Space Relationships: Location, Size, Shape

The Turtle Mountain Indian Reservation is located in about the east-west mid-point of North Dakota in the County of Rolette near the Canadian border. North Dakota Highway 5 is the major east-west route through the area. U.S. Highway 281, and North Dakota State Highway 3 provide access to the reservation from the south.

In terms of relationship to the urban areas of North Dakota, the reservation is rather isolated. Bismarck is approximately 200 miles to the south, Grand Forks is 178 miles to the southeast, and Minot is 206 miles southwest of the reservation.

The boundary of the reservation enclosed a rectangular area of two townships, six miles wide and twelve miles long.

#### Topography

The Turtle Mountains, a rough moraine-covered table-land, rise 400 to 800 feet above the surrounding plain. The Turtle Mountains are located near the Canadian border and cover an area of about 800 square miles. Approximately one-half of this area is located in North Dakota.

The landscape bears evidence of the intensive glacial activity which completely covered the area. The numerous poorly drained bogs and small lakes, as well as the rough hilly surface, all indicate the effect of the heavy ice sheet.

The Turtle Mountains were once a part of the Missouri Plateau, but thousands of years of erosion to the surrounding drift plain completely separated this more resistant remnant from the main plateau.<sup>1</sup>



Fig. 2. -- Poorly drained lakes and bogs such as the above are typical over the majority of the reservation.

---

<sup>1</sup>North Dakota Geological Survey. The Geology of North Dakota. Bulletin No. 31. 1956.

Climate

The climate of the area can be classified as sub-humid continental dominated by a cold severe winter. The predominant air mass influence during the winter is the polar continental air mass moving down from Canada. However, occasional outbreaks of Arctic continental air cause prolonged periods of sub-zero temperature during January and extending into February. Snowfall during the winter averages thirty-six inches. Most of the winter storms are of the cyclonic variety caused when the cold Canadian air masses come into contact with the warmer Gulf air masses.

Summer is a time of awakening in the Turtle Mountains. The drab colors of winter are exchanged for a deep green, producing a bluish haze when viewed from afar.

The summer rains are usually adequate for agriculture, with the maximum monthly precipitation occurring in August. Summer precipitation is mainly convectonal and cyclonic in origin and is characterized by numerous thunder showers.

When considering the causes of moisture in the Turtle Mountains, one cannot rule out the possibility of orographic precipitation. Although the Turtle Mountains reach a height of 800 feet above the surrounding plain, in actual elevation the area is between 2,000 and 3,000 feet above sea level.<sup>2</sup> The orographic aspect may account for the higher yearly precipitation total of the Turtle Mountains as compared to neighboring lowland areas.

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<sup>2</sup>Melvin E. Kazeck, North Dakota: A Human and Economic Geography (Minneapolis: Land Press, Inc., 1956), p. 78.

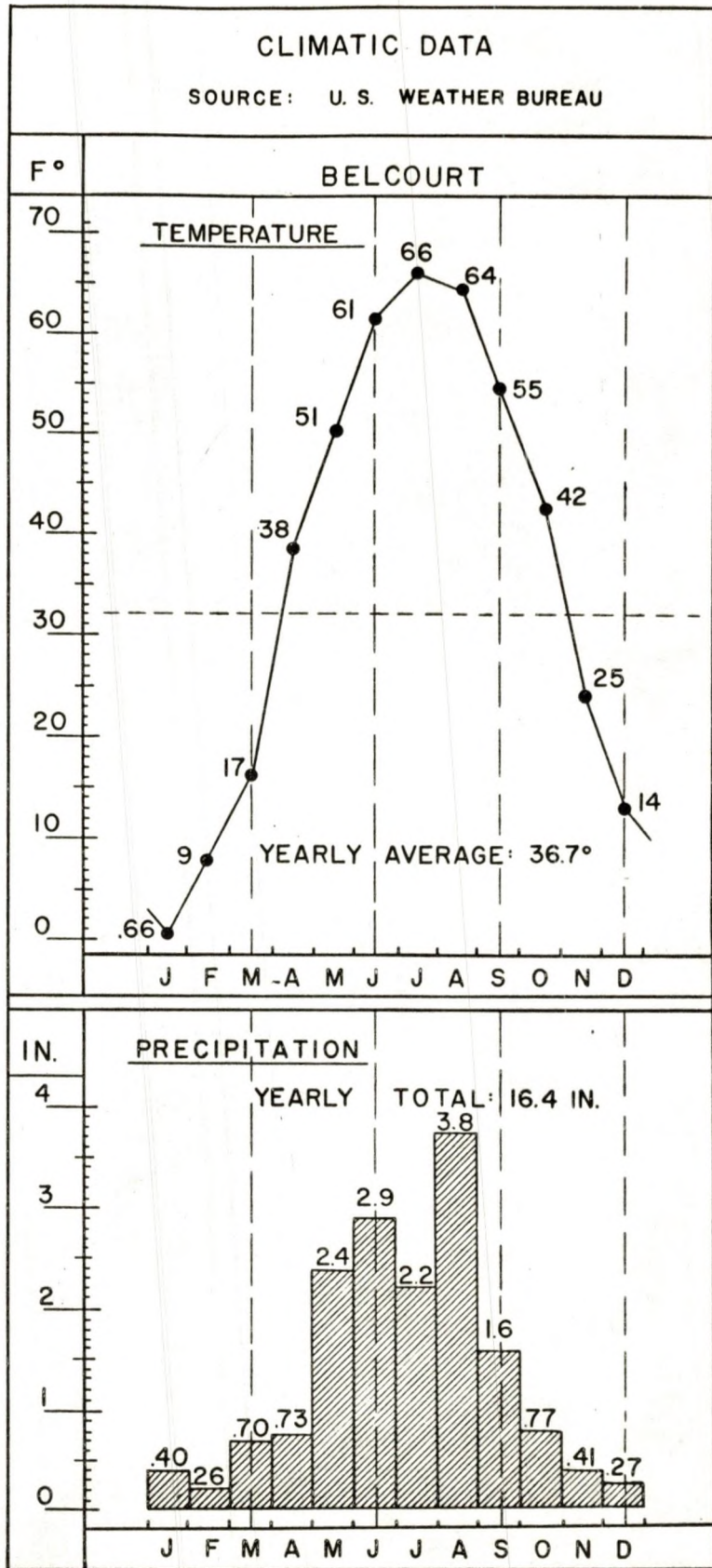


Fig. 3



### Soils

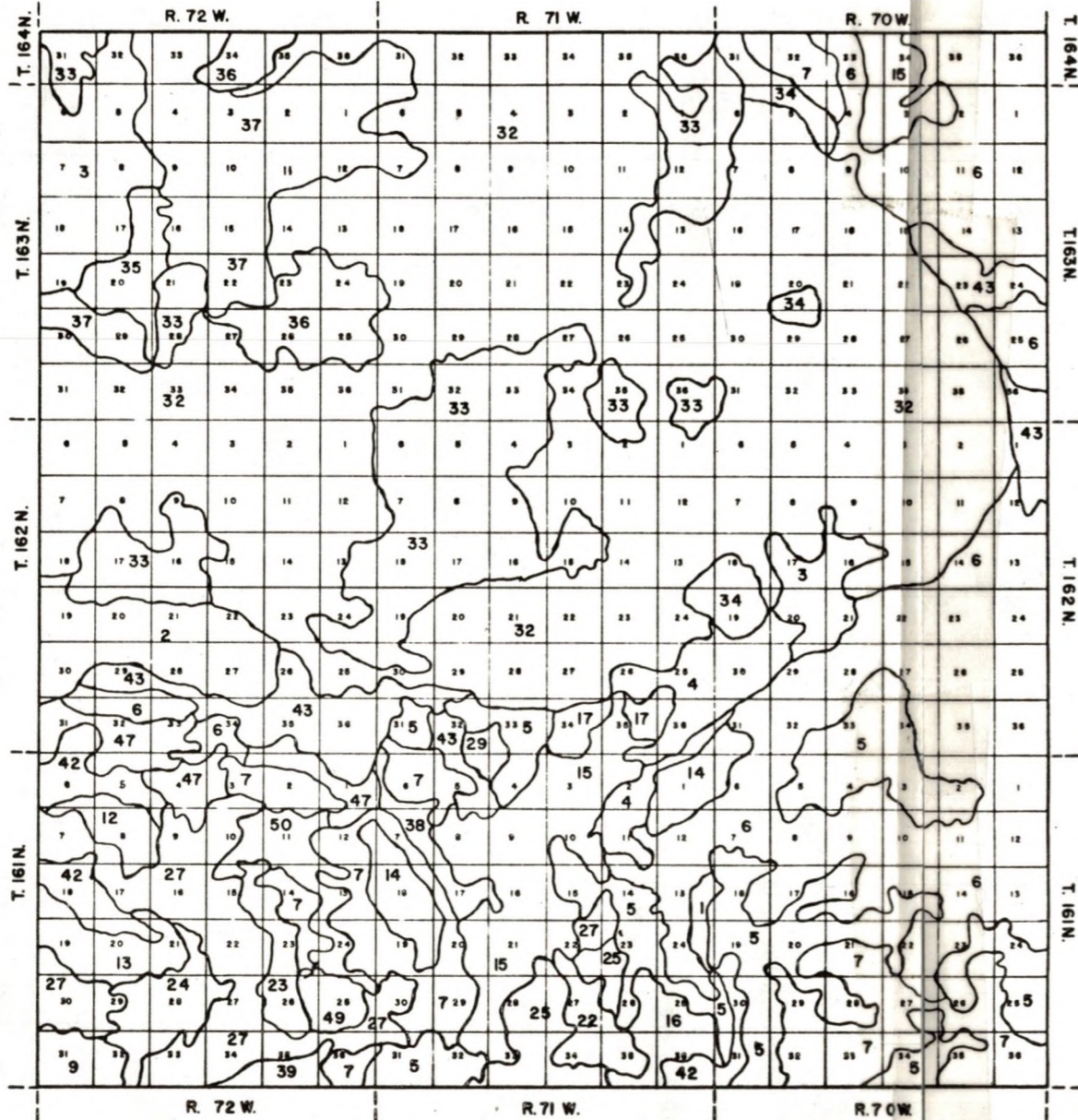
The soils of the area are a result of glaciation and contain a noticeable amount of sand, gravel and rock. From the general soils map (Fig. 3), it is evident that code number 32, Kelvin Bottineau, Strongly rolling, dominates the majority of the reservation. However, it must be noted that the soil classification of the reservation land is very general because the soils of the area have not been thoroughly surveyed and classified.

The strongly rolling Kelvin Bottineau series falls within the loams and clay loams phases. Throughout the wooded area the soils belong to the Gray Wooded Group. Thick vegetation coupled with the particular climate regime of the area maintains the acidic status of the soil.

The associated soils found in the cleared areas have a thick black A horizon and are high in organic matter. These soils fall within the Chernozem group which is a result of abundant grass cover, good drainage and sub-humid continental climate. From the standpoint of agricultural production, the Chernozem soil reigns supreme in this area. These well-drained Chernozem soils correspond to the agricultural land noted on the general land use map ( Fig. 6. ) .

### Natural Vegetation

The reservation area supports an abundant growth of deciduous and coniferous vegetation. The deciduous is the most dominant of the two types, and poplar, birch, oak, willow, and aspen are the major types to be found. The forest vegetation is densest in the lower,



Soils with Thin Surface Layer (Regosol) and Associated Soils with Thick Black Surface Layer (Chernozem), or Gray Surface Layer (Gray Wooded)

Loams  
 1. Buse  
 2. Buse-Barnes  
 hilly and steep  
 strongly rolling

Loams with Sandy and Gravelly Substrata  
 3. Sioux-Kelvin  
 4. Sioux-Buse  
 strongly rolling  
 strongly rolling

Soils with Thick Black Surface Layer (Chernozem) and Associated Soils with Thin Surface Layer (Regosol), Very Limy Subsoil (Lime Solonchak), Alkali Claypan Subsoil (Solonetz), or Wet Soils (Humic Gley)

Loams and Clay Loams  
 5. Barnes-Buse  
 6. Barnes-Hamerly  
 7. Barnes-Svea  
 9. Gardena-Aberdeen  
 13. Svea-Cresbard  
 14. Svea-Hamerly  
 rolling  
 undulating  
 undulating  
 nearly level  
 gently undulating  
 gently undulating

Loams with Sandy and Gravelly Substrata  
 15. Renshaw  
 16. Renshaw-Benoit  
 17. Renshaw-Sioux  
 nearly level  
 nearly level  
 undulating

Sandy Loams with Sandy Substrata  
 22. Hecla  
 23. Hecla-Ulen, till substratum  
 24. Hecla-Letcher, till substratum  
 25. Maddock-Hecla  
 27. Maddock-Hecla, till substratum  
 nearly level  
 nearly level  
 nearly level  
 nearly level  
 undulating

Loamy Sands with Sandy Substrata  
 29. Maddock-Hecla  
 rolling

Soils with Gray Surface Layer (Gray Wooded) and Associated Soils with Thick Black Surface Layer (Chernozem)

Loams and Clay Loams  
 32. Kelvin-Bottineau  
 33. Kelvin-Bottineau  
 34. Kelvin-Bottineau  
 35. Kelvin-Rolla  
 strongly rolling  
 rolling  
 undulating  
 rolling

Clays  
 36. Rolla  
 37. Rolla  
 gently sloping  
 nearly level

Soils with Very Limy Subsoil (Lime Solonchak) and Associated Soils with Thick Black Surface Layer (Chernozem), or Alkali Claypan Subsoil (Solonetz)

Loams and Clay Loams  
 38. Bearden  
 39. Glyndon-Gardena  
 nearly level  
 nearly level

Loams with Sandy and Gravelly Substrata  
 42. Divide-Benoit  
 43. Divide-Renshaw  
 nearly level  
 nearly level

Wet Soils with Very Limy Subsoil (Lime Solonchak) and Poorly Drained Soils of Depressions (Humic Gley)

Loams and Clay Loams  
 47. Colvin-Borup-Perella  
 nearly level

Soils with Alkali Claypan Subsoil (Solonetz)  
 Loams and Clay Loams

49. Cavour-Cresbard  
 50. Exline  
 gently undulating  
 nearly level

GENERAL SOIL MAP

INDIAN LAND OF ROLETTE COUNTY

EXTRACTED FROM MAP  
 PREPARED BY THE NORTH DAKOTA  
 AGRICULTURAL EXPERIMENT STATION  
 DEPARTMENT OF SOILS

SCALE: 1 INCH = 2 MILES

poorly drained areas. Grass cover predominates in the southern portion of the reservation where the steep slope gradually diminishes into the surrounding plain.

Wild fruits are numerous throughout the area and consist of Chokecherry, Juneberry, Pin Cherry and Cranberry.



Fig. 5. -- Road building into Belcourt Lake.  
Note the dense forest growth.

## CHAPTER III

### HUMAN GEOGRAPHY OF THE TURTLE MOUNTAIN INDIAN RESERVATION

#### The Historical Background

The present occupants of the Turtle Mountain Indian Reservation trace their Indian lineage back to the Chippewas, a leading branch of the Algonquin family of North America. The Chippewas, although not prominent in history due to their remote location from the colonial wars and later the main routes of westward movement, did occupy an extensive territory. During the three centuries immediately following the discovery of America, the Chippewa territory extended indefinitely back from the northern and eastern shore of Lake Superior and Lake Huron, westward into the present Dakotas and Montana.<sup>1</sup> In addition, at one time they were the most numerous tribe north of Mexico.<sup>2</sup> However, the Chippewa territory was composed of loosely defined bands independent of strong central control.

The nucleus of one of these bands settled in the Turtle Mountains, and occupied an area extending from the Canadian border south to Devils Lake and from the Pembina Mountains (Manitoba Escarpment)

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<sup>1</sup>R. W. Dunning, *Social and Economic Change Among the Northern Ojibwa* (Toronto: University of Toronto Press, 1959), p. 4.

<sup>2</sup>United States Department of the Interior, Bureau of Indian Affairs, Information on the Chippewa Indians -- Turtle Mountain Reservation, June, 1963. p. 1

on the east, indefinitely westward.<sup>3</sup>

As game grew scarce, particularly with the passing of the buffalo, the condition of the Indians greatly deteriorated, often to starvation. Hence, on March 3, 1873, Congress appropriated \$25,000 for the purchase of a township on the White Earth Reservation in Minnesota as a home for the Turtle Mountain Indians. The Turtle Mountain Indians, however, refused to move, maintaining that their claim to the territory was valid. Finally, on October 2, 1892, a treaty was provided whereby the tribe ceded claims to all territory except two townships within the Turtle Mountain area.<sup>4</sup> In addition, a cash payment of \$1,000,000 was made to the tribe for land ceded (9,000,000 acres).<sup>5</sup> On April 21, 1904, this treaty was approved by Congress.

#### The Present Population

Records reveal some 12,000 enrolled members of the reservation, with approximately 6,000 living on or in the vicinity of the reservation.<sup>6</sup> The 6,000 not living on the reservation are scattered over the entire United States.<sup>7</sup>

To define the present population of the reservation as Chippewas, and leave it at that, would be deceiving. The influx of French into the area, as well as a lesser number of English, Scotch, Irish and Syrian

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<sup>3</sup>Ibid., 2.

<sup>4</sup>Ibid.

<sup>5</sup>Ibid., 3.

<sup>6</sup>Ibid.

<sup>7</sup>Ibid.

has produced a rather mixed racial composition. At present there are only about 200 full blood individuals.<sup>8</sup> Despite the use of the Chippewa language by many of the inhabitants, the present population lacks most of the cultural characteristics of the old Chippewa people.

#### Administration

The Tribal Constitution and by-laws provide for a democratically elected Tribal Council. The organization of this council consists of a chairman and eight council members. The chairman is elected at large and serves a term of two years. The council members also serve two-year terms and are elected from their districts. A vice-chairman is elected from within the Tribal Council and a secretary-treasurer is appointed by the Tribal Council.

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<sup>8</sup>Ibid.

## CHAPTER IV

### THE WORKS OF MAN

#### Agriculture

The location of the cultivated cropland and the hayland tends to form a definite pattern in relation to the reservation's geographical factors. Cropland, indicated by the letter (c) on the Generalized Land Use Map (Fig. 5.), occupies the southern and eastern margins of the reservation. It is in this area that the majority of the reservation's 8,000 acres of cultivated land is located. The slope tends to be less steep and the drainage patterns are generally better than the remainder of the reservation. This is also the area of the darker Chernozem soil.

For a more detailed representation of the reservation's cultivated area, the reader should study the maps on pages 55-61 of Appendix III. It should be noted that even in this area the cropland is generally in small tracts and is often broken up by steep slopes and bogs.

The 4,427 acres of reservation land devoted to hay falls under a somewhat different pattern than the cultivated land. Referring to the Generalized Land Use Map (Fig. 6.), hayland is scattered throughout the reservation area. With a few exceptions it is generally related to poorer drainage and steeper slope.

Production figures, recorded over a period of time, are the best means of evaluating agricultural output. In the case of the Turtle

GENERALIZED LAND USE MAP  
 INDIAN LAND OF ROLETTE COUNTY, NORTH DAKOTA

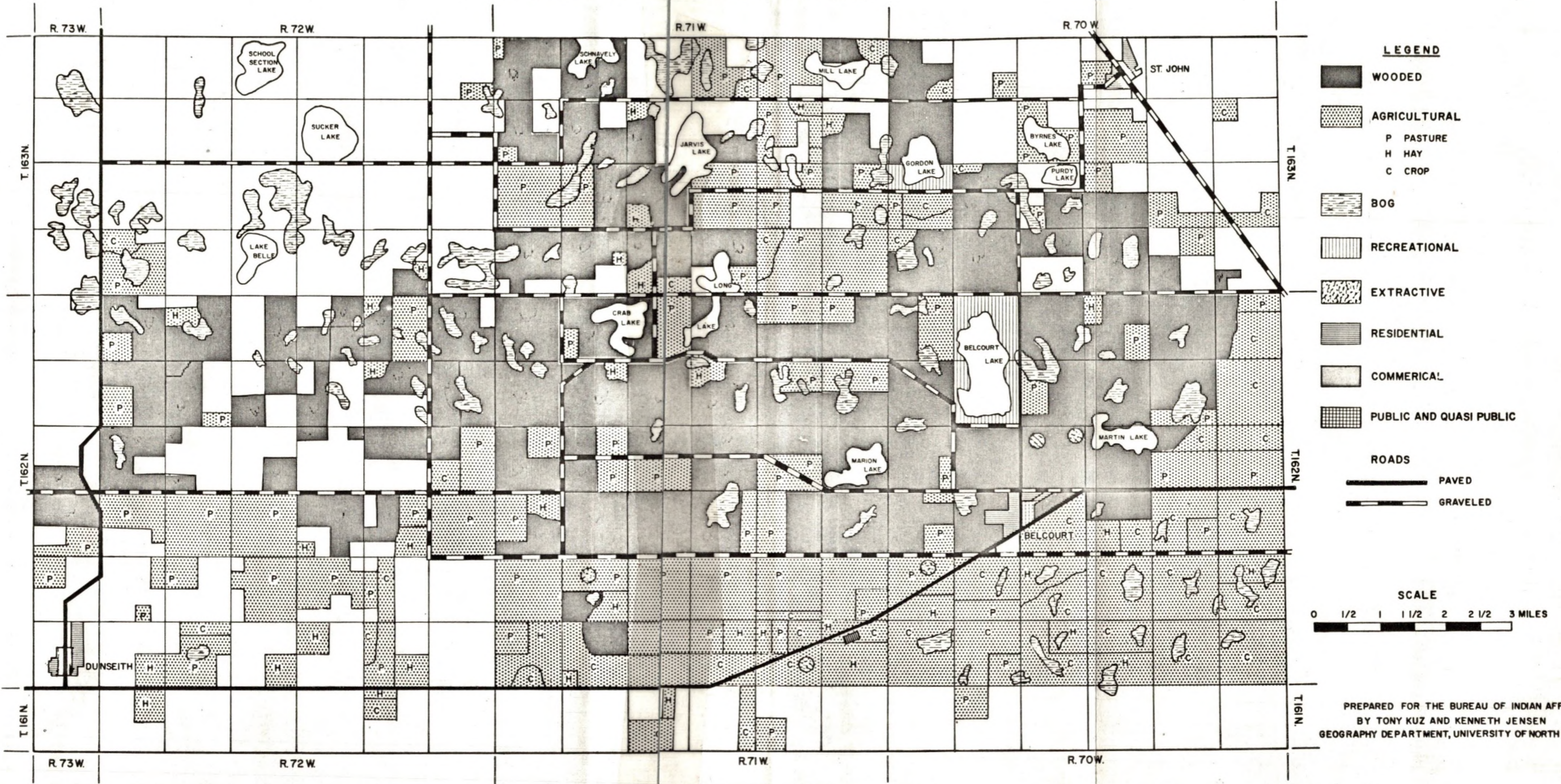


Fig. 6

**LEGEND**

- WOODED
- AGRICULTURAL
  - P PASTURE
  - H HAY
  - C CROP
- BOG
- RECREATIONAL
- EXTRACTIVE
- RESIDENTIAL
- COMMERCIAL
- PUBLIC AND QUASI PUBLIC

**ROADS**

- PAVED
- GRAVELED

**SCALE**

0 1/2 1 1 1/2 2 2 1/2 3 MILES

PREPARED FOR THE BUREAU OF INDIAN AFFAIRS  
 BY TONY KUZ AND KENNETH JENSEN  
 GEOGRAPHY DEPARTMENT, UNIVERSITY OF NORTH DAKOTA



Mountain Indian Reservation, figures are grossly lacking. Hence, observation must suffice.

Wheat, barley, flax and oats are the major crops produced by the Indian farmers. Most of the hay is cut from around the bogs and is of the grass variety. The percentage devoted to alfalfa hay within the reservation is presently insignificant.

Rainfall is generally adequate for most crops raised in the area. During some periods of favorable precipitation regime wheat yields have averaged as high as fifty bushels per acre.

Many methods employed by the present Indian farmers are considered out-dated by today's standards. Small field patterns, lack of capital, and general unawareness of modern development account for many of the problems facing the reservation's agricultural economy.

Farm machinery is noticeably lacking on the reservation. An Indian farming his own land must hire most of the field preparation and harvesting, which of course reduces his profits.

Most of the farm buildings throughout the reservation are in dire need of repair. Inside plumbing is completely lacking, and in most instances water for human consumption is carried from a nearby lake or well.



Fig. 7. -- An Indian farmhouse.



Fig. 8. -- Picture showing one of the few wells on the Turtle Mountain Indian Reservation.

### Grazing and Animal Husbandry

Within the reservation, approximately 16 per cent of the land is devoted to pasture. As the acreage totals in Appendix II indicate, 2,745 acres are in cleared pasture, while 4,427 acres are in wooded pasture.

Overgrazing is a constant problem. The Indian farmers lack capital to finance fencing in order to partition their fields and control herds.



Fig. 9. -- Example of overgrazed pasture.

There are very few large fields of cleared pasture. Most of the cleared pasture land is scattered throughout the reservation in small plots, often within a larger field of wooded pasture. This can be attributed to the fact that most of the land devoted to cleared pasture is unsuitable for cultivation. It is either too rocky, too steep, or the drainage is such that cultivation would be impossible during all except the driest years. With the exception of a few plots, planted

pasture is lacking on the reservation.

The wooded pasture land is of little economic value. The grass is of little value and is relatively sparse due to the dense undergrowth.

The 694 head of dairy cattle account for the largest single variety of livestock on the reservation. Milk that is not used by the farmer is sold locally without benefit of processing. There are 540 head of beef cattle, 154 swine, and 6 goats on the reservation. This is a rather large number of horses on the reservation. Recent estimates place their number at 285. Most of the horses are riding animals, but a few are still used as draft animals.<sup>1</sup>

#### Mining

The only known resources that are available for mining purposes are sand and gravel. The scattered gravel pits have been only slightly developed. The extent, quality, and usefulness other than road work of the deposits are unknown.

As the land utilization map plainly shows, the gravel pits utilized are those in close proximity to a road.

#### Forestry

In spite of the recreational potential of the forested area, it is of little immediate economic value. In addition to providing firewood, the forest yields oak, aspen, ash, and willow fence posts.

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<sup>1</sup>Interview with Edmund Sand, Land Operations Officer, Turtle Mountain Indian Agency, Belcourt, North Dakota. July 22, 1964

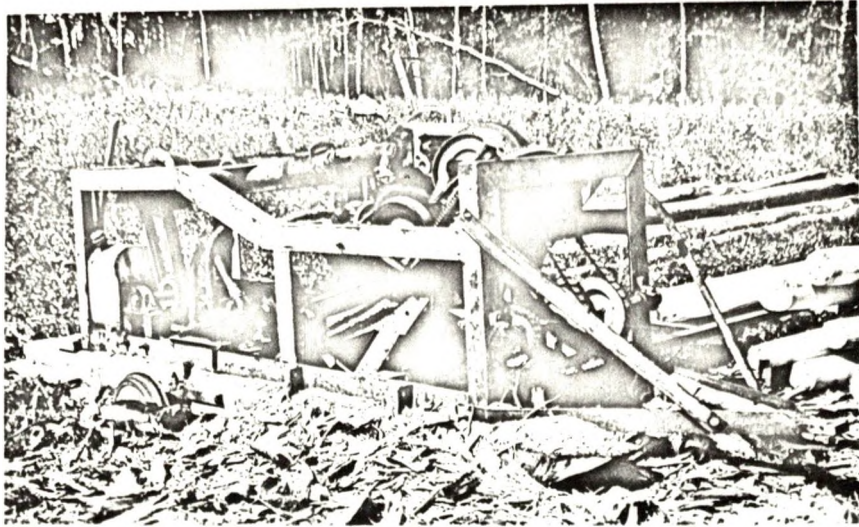


Fig. 10. -- A post peeler at work on the Turtle Mountain Reservation.

### Manufacturing and Commerce

At present, manufacturing is completely lacking on the reservation. Services rendered through the Bureau of Indian Affairs have been the largest single source of employment for the Indian people. All bus drivers, janitors, cooks, maintenance helpers, mechanics, and Roads employees are Indian.<sup>2</sup> A large percentage of the office staff, teachers, nurses, and other hospital employees are Indian.<sup>3</sup>

The local reservation town of Belcourt provides very few employment opportunities. The town consists of a post office, a Red Owl Store, two cafes, a bar, two service stations, a Tastee Freeze drive-in,

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<sup>2</sup>Information on the Chippewa Indians -- Turtle Mountain Reservation, 1963, p. 5

<sup>3</sup>Ibid.

and a funeral home. The Tastee Freeze drive-in and the two service stations, are the only commercial establishments located along State Highway 5. Consequently, they have access to the tourist trade which is appreciable during the summer months.

The construction of a plant producing Indian artifacts for markets outside the area was initiated during the summer of 1964. At present, a number of Indians are enrolled in vocational training to fill positions when the plant begins production. Its location along State Highway 5, about two miles southwest of Belcourt, is intended to attract tourist trade.



Fig. 11. -- View of the Belcourt Indian Agency. The large building to the left is the Indian Hospital. The large multi-story building in the background is the Indian School.

Recreation

Recent recreational development within the reservation boundary has centered around Belcourt Lake. The Lake has a favorable location; it is approximately two miles north of State Highway 5 and is accessible via a paved road.

One of the first projects in the development of Belcourt Lake was the recently constructed spillway at the southeast end. The spillway will permit the control of the lake level.

Another dam construction was recently completed at Long Lake. A channel connecting Long Lake and Belcourt Lake will further assure an abundant supply of water for the latter.

Other projects in the Belcourt Lake area include road construction for easy access and camp site development. Recently, a large number of fish were planted in Belcourt Lake to help build up the depleted stock.



Fig. 12. -- Picturesque Belcourt Lake when fully developed could compete as a recreational area in North Dakota.

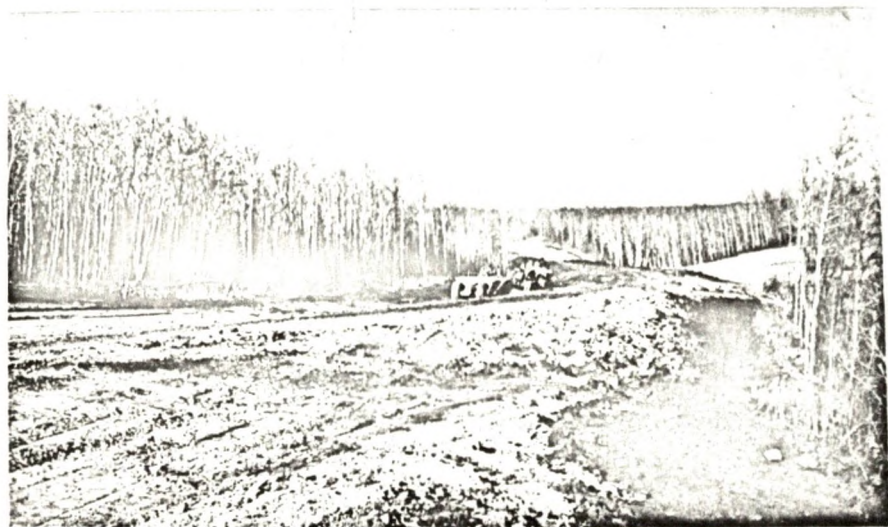


Fig. 13. -- Road construction providing easy access to Belcourt Lake.



## CHAPTER V

### INTERRELATIONSHIPS AND RECOMMENDATIONS

In summation the writer presents the results of this survey of land utilization on the Turtle Mountain Reservation as background for further research and improvement of facilities and resources.

One of the most beautiful areas in the state is the Turtle Mountains of North Dakota. The pleasant summer temperatures, characterized by cool nights, are usually a few degrees cooler than the remainder of the state.

The numerous lakes dotting the area are ideal for the development of water sports. Lake conservation projects such as the one initiated on Belcourt Lake are urgently needed, if the recreational potential of the area is to be realized. A stable and controllable water level is needed if fishing is to become a major attraction. In addition, beach areas for boating and swimming would surely add to the overall recreational development of the area.

Major attention must be directed toward development and beautification of the forested areas. Landscaping, brush clearing, and reforestation would all add to the appeal of the Turtle Mountains. The dense forest provides an ideal situation for the development of riding trails. Horseback riding is a popular pastime among vacationers, and the Turtle Mountains offer an ideal setting for this activity.

The current projects, clearing areas for camp sites and trailer parks, are a step in the right direction. The construction of more roads and the improvement of old ones, are essential.

The location of the reservation is often considered a drawback. Although location is a major factor in the case of the Turtle Mountains, the isolation of the area is diminishing. The growing popularity of the International Peace Garden is attracting more and more tourists each year.

At present there are only three commercial enterprises in the town of Belcourt benefiting from the summer tourist trade. With the increase of tourism into the area reservation residents will benefit. A greater tourist traffic will create demands for new facilities such as motels, restaurants, gas stations, and other commercial enterprises resulting in an approved employment situation.

The natural physical resources for recreation in the Turtle Mountain Indian Reservation require man's initiative and imagination, if they are to benefit him.

Considering the agricultural potential of the Turtle Mountains, the writer is not optimistic. The physical environment offers little hope of appreciable agricultural development in the immediate future.

Granted, the annual precipitation is adequate for a variety of crops, but this is offset by the short growing season of approximately 117 days. The soils seem to be an asset of the area, but again it must be pointed out that the soil classification on the reservation is extremely general. When one considers the inadequate drainage,

topography certainly cannot be viewed a favorable factor.

The survey revealed approximately 18 per cent of the reservation land classified as waste (bog, intermittent lakes, etc.) Fifty per cent is wooded. The major portion of the 9 per cent utilized as hayland surrounds bogs. Pasture land, comprising 6 per cent of the reservation, is marginal and cannot be cultivated.

In the final analysis, only 17 per cent of the reservation land is suitable for cultivation. The remainder is either too steep, too rocky, too wooded, or too poorly drained.

Of primary importance to expansion of cultivated land would be the mapping of the drainage patterns. A survey of this nature is essential if the large area dominated by bogs and shallow lakes is to be made productive.

Land clearing is also of primary importance on the list of agricultural recommendations. An inspection of the maps included in Appendix III reveals that a noticeable percentage of the wooded area would be favorable to cultivation if cleared. The major obstacle to land clearing is lack of funds.

Experimentation in growing new crops in the area is needed. At present, experiments of this nature are being conducted by Mr. Edmund Sand, Land Operations Officer in Belcourt.

One of the objectives of this study has been to locate and evaluate the concentrations of wild fruit. Results from the fruit survey are quite favorable and indicate an ample supply for the establishment of a small fruit processing plant at Belcourt.

At present the extensive wooded areas of the reservation add little to the economy. It is quite possible that unproductive growth could be cleared and replanted into trees marketable for timber. During the summer of 1964 wooded land was cleared and replanted with Christmas trees for future markets. In addition the reforestation project would coincide with the overall plan of improving the recreational attractiveness of the area.

The prospects of industry moving into the area are very discouraging. The abundance of a cheap labor supply cannot be denied, but this does not offset the limiting factors. The reservation and surrounding area lack both a power source and a mineral base. Isolation from market centers cannot be overlooked and development from within is limited by the gross lack of capital.

The establishment of a plant producing Indian artifacts during the summer of 1964 is encouraging. It represents initiative on the part of the Indian population. Manufacturing of commodities requiring skills in manual dexterity are best suited to the reservation.

The problem confronting the Turtle Mountain Indian Reservation is one of overpopulation. Economic development cannot keep pace with the rate of population growth. Worthwhile projects for effective utilization can be initiated, but even one-hundred per cent efficiency will not relieve the increasing population pressure.

Attempts to relocate the Indian in areas of better employment opportunities have failed. The close family ties and relationship bind

him to the reservation. Any attempt to control the high birth rate is difficult due to the religious opposition.

The problems facing the Turtle Mountain Indians are numerous, and seem insurmountable, but with improved leadership and motivation within the tribe and more progressive assistance from the contributing agencies, the social and economic status will be elevated.

APPENDIX I  
LAND USE KEY

Cultural Features (numerator)

<u>1st digit</u>	<u>2nd digit</u>	<u>3rd digit</u>
	1. Cultivated	1. Tilled 2. Idle
1. Agricultural	2. Pasture	1. Natural 2. Planted 3. Wooded 4. Idle non-fenced
	3. Hayland	1. Natural 2. Planted
	1. Wooded	1. Tall trees 2. Small trees - shrubs - dense undergrowth 3. Planted trees 4. Abandoned farmland growing to shrubs 5. Slash & burn 6. Recreational
2. Rural Non-farm	2. Non-wooded	1. Brush & brambles 2. Swamp and intermittent lakes 3. Wasteland - rock cliffs, gravel pits, etc Bogs
3. Urban	1. Platted town 2. Ribbon town	

Physical Features (denominator)1st digit (Slope)

1. Level and nearly level 0-6 per cent
2. Undulating 7-12 per cent
3. Hilly 13-18 per cent
4. Steep 18 per cent and over

2nd digit (Drainage)

1. Adequate
2. Poor - dried beds of stagnant water
3. Very poor - about 1/3 area shows evidence of stagnant water

3rd digit (Stoniness)

1. No stones
2. Stony - but does not prevent cultivation
3. Stony - prevent cultivation unless removed

4th digit (Erosion)

1. Practically none - little evidence of runoff by sheet or gully
2. Little - some evidence of above
3. Excessive sheet erosion and gullyng

WILD FRUIT CODE

- C      CHOCHECHERRY: significant concentration  
 C<sub>1</sub>    CHOCHECHERRY: present, but insignificant growth
- JB      JUNE BERRY: significant concentration  
 JB<sub>1</sub>    JUNE BERRY: present, but insignificant growth
- CB      CRANBERRY: Significant concentration  
 CB<sub>1</sub>    CRANBERRY: present, but insignificant growth
- PC      PINCHERRY: significant concentration  
 PC<sub>1</sub>    PINCHERRY: present, but insignificant growth

## APPENDIX II

### ACREAGE TABULATION

Acreage is broken down by individual sections in the following table except in areas where two sections form a homogeneous unit uninterrupted by a road. The table is subdivided into township and range for ease of location. In addition, totals are indicated in the following manner: ( 1 ) total land on the reservation; ( 2 ) total Fee Patent Land;<sup>1</sup> and ( 3 ) the total Indian Trust Land.<sup>2</sup>

The six headings refer to the corresponding code digits: ( 1 ) Cultivated ( 111-112 ) , ( 2 ) Pasture ( 121, 122, 124 ) , ( 3 ) Pasture Wooded ( 123 ) , ( 4 ) Hayland ( 131-132 ) , ( 5 ) Wooded ( 211, 212, 215, 216, 221 ) , and ( 6 ) Wasteland ( 222, 223, B ) .

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<sup>1</sup>Fee Patent is land issued by the Federal Bureau of Land Management. The land is taken out of the federal ownership classification and is issued to individuals. It is privately owned and subject to federal and state taxes.

<sup>2</sup>Indian Trust Land is divided into two categories: ( 1 ) Tribal ownership, and ( 2 ) Allotted land. Allotted land on the reservation is issued to individuals by the tribe. It can be inherited, but cannot be sold or partitioned.



## TOWNSHIP 162 N. RANGE 71 W.

SECTION	CULTIVATED	PASTURE	PASTURE WOODED	HAY	WOODED	WASTELAND
1-12	8	-	370	70	650	182
2-3	-	-	238	-	732	310
4-5	-	21	308	6	660	285
6-7	-	-	-	60	1002	218
8-9	-	-	-	70	1001	209
10-11	-	-	204	83	707	286
13	-	-	-	-	378	262
14-23	20	-	364	59	568	269
15-22	-	-	216	56	898	110
16-17	11	-	589	38	523	119
18	-	-	160	56	413	21
19	52	-	197	80	262	49
20-21	-	-	-	-	1137	143
24	-	-	-	21	494	125
25-36	230	44	129	331	216	190
26	135	133	-	23	335	14
27	133	269	63	-	153	22

## TOWNSHIP 162 N. RANGE 71 W. (Cont'd)

SECTION	CULTIVATED	PASTURE	PASTURE WOODED	HAY	WOODED	WASTELAND
28	-	195	-	37	376	32
29	-	29	73	110	299	129
30	-	228	21	181	200	10
31	97	127	-	248	-	168
32	152	-	-	235	-	253
33	33	215	-	360	-	32
34	313	94	-	144	20	69
35	3 21	185	-	96	-	38

## TOWNSHIP 162 N. RANGE 70 W.

1	257	84	110	100	89	
2	-	-	-	-	508	132
3	-	-	58	54	413	115
4-9	-	-	173	-	843	264
5-8	47	-	-	-	614	619
6-7	50	-	248	-	692	290
10	-	-	10	16	480	134

## TOWNSHIP 162 N. RANGE 70 W. (Cont'd)

SECTION	CULTIVATED	PASTURE	PASTURE WOODED	HAY	WOODED	WASTELAND
11	33	4	83	-	347	173
12	573	-	67	-	-	-
13	386	148	65	-	99	12
14	167	116	162	-	135	60
15	14	480	20	-	376	182
16	-	-	80	-	509	51
17	-	-	-	-	580	60
18	-	-	80	10	480	70
19	-	-	114	119	299	108
20 <sup>a</sup>	-	38	-	13	232	192
21 <sup>b</sup>	117	14	-	78	269	127
22	238	20	-	147	137	98
23	431	-	-	42	-	167
24	459	29	32	5	-	115

<sup>a</sup>165 acres of section 20 are classified as urban (31).

<sup>b</sup>35 acres of section 21 are classified as urban (31).

## TOWNSHIP 162 N. RANGE 70 W. (Cont'd)

SECTION	CULTIVATED	PASTURE	PASTURE	WOODED	HAY	WOODED	WASTELAND
25	301	-	-	-	201	-	138
26	432	51	-	-	21	-	136
27	252	-	-	-	119	-	269
28	287	-	-	-	106	-	247
29 <sup>C</sup>	259	148	20	20	30	67	66
30	13	242	140	140	71	-	174
31	342	101	-	-	80	-	117
32	398	120	-	-	67	-	55
33	290	42	199	199	-	-	109
34	213	-	-	-	237	-	190
35	462	-	-	-	-	-	178
36	534	-	33	33	-	-	73

<sup>C</sup>50 acres of section 20 are classified as urban (31)

ACREAGE TOTALS

TYPE	RESERVATION		INDIAN TRUST			FEE PATENT		
	ACRES	Percentage OF TOTAL	ACRES	Percentage OF RESERVATION TOTAL	Percentage OF INDIAN TRUST	ACRES	Percentage OF RESERVATION TOTAL	Percentage OF FEE PATENT
CULTIVATED	8,000	17	6,810	85	19	1,190	15	17
PASTURE	2,745	6	2,220	81	5	525	19	7
PASTURE WDED.	4,427	10	3,464	78	9	963	22	13
HAYLAND	3,932	9	2,733	70	7	1,199	30	17
WOODED	18,203	30	16,153	88	42	2,050	12	28
WASTELAND	8,529	40	7,319	86	17	1,210	14	18
URBAN <sup>d</sup>	244		217			27		
TOTAL	46,080	100	38,916	80.5	100	7,164	19.5	100

<sup>d</sup>Insignificant percentage

APPENDIX III  
MAPPED FRACTIONAL SUMMARY  
OF THE TURTLE MOUNTAIN  
INDIAN RESERVATION

LAND LOCATION GRID: TURTLE MOUNTAIN INDIAN RESERVATION

				R. 71 W.				R. 70 W.															
				RESER		VATION		BOUNDAR		RY													
				6	5	4	3	2	1	6	5	4	3	2	1								
				7	8	9	10	11	12	7	8	9	10	11	12	RESER		VATION		BOUNDAR		RY	
				18	17	16	15	14	13	18	17	16	15	14	13	RESER		VATION		BOUNDAR		RY	
				19	20	21	22	23	24	19	20	21	22	23	24	RESER		VATION		BOUNDAR		RY	
				30	29	28	27	26	25	30	29	28	27	26	25	RESER		VATION		BOUNDAR		RY	
				31	32	33	34	35	36	31	32	33	34	35	36	RESER		VATION		BOUNDAR		RY	
				R. 71 W.				R. 70 W.															

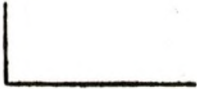



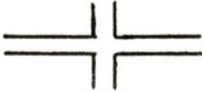
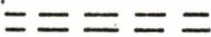







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T. 162 N.

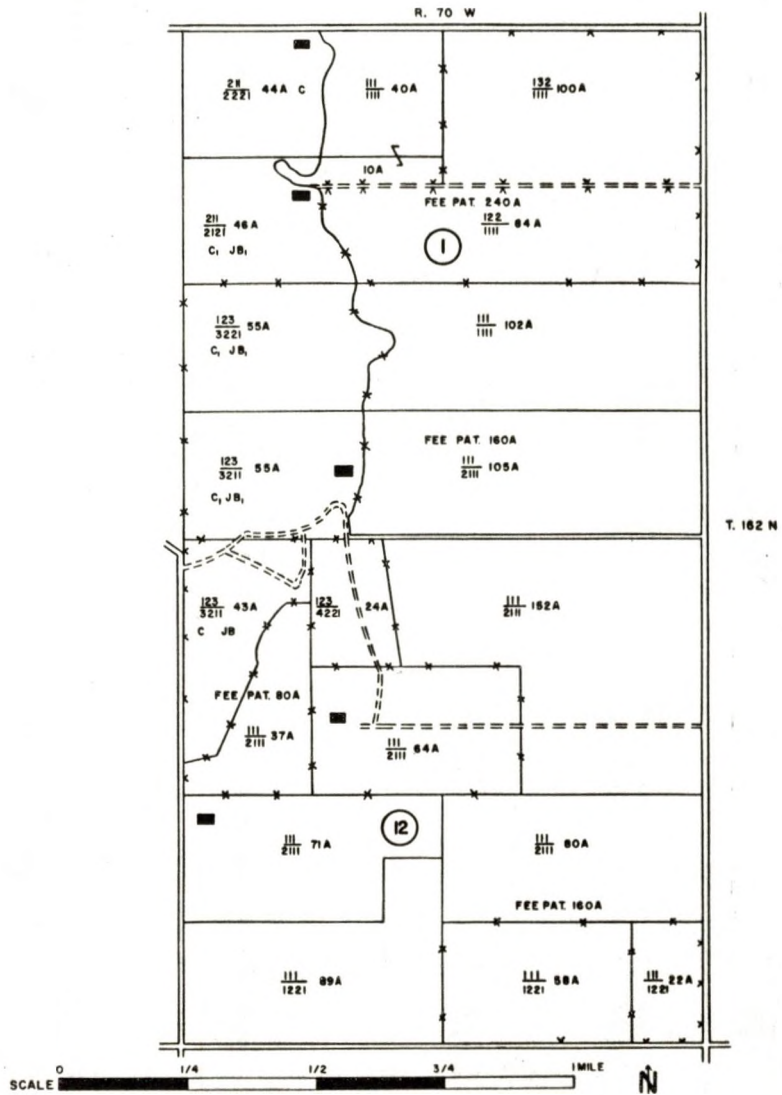
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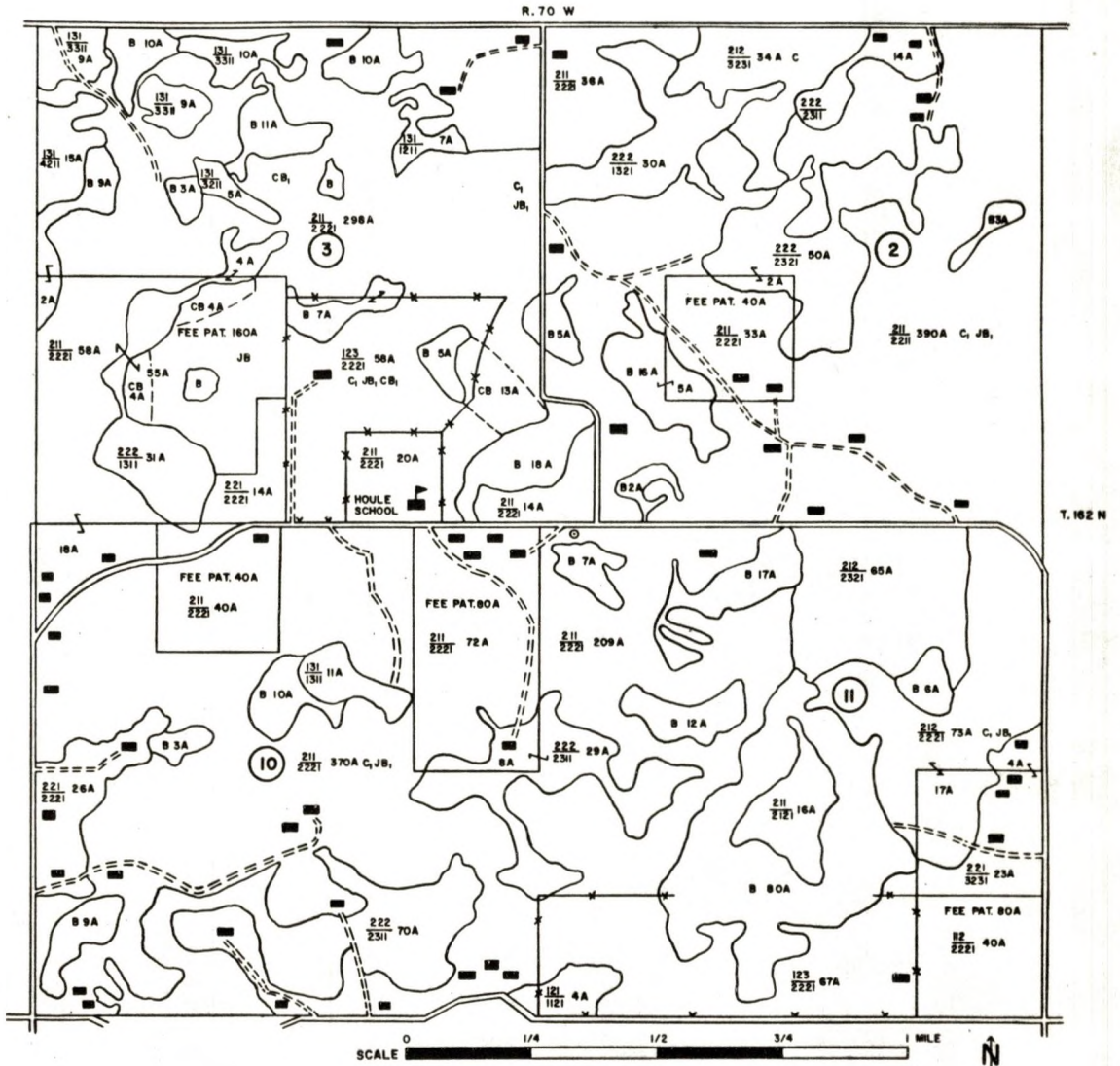
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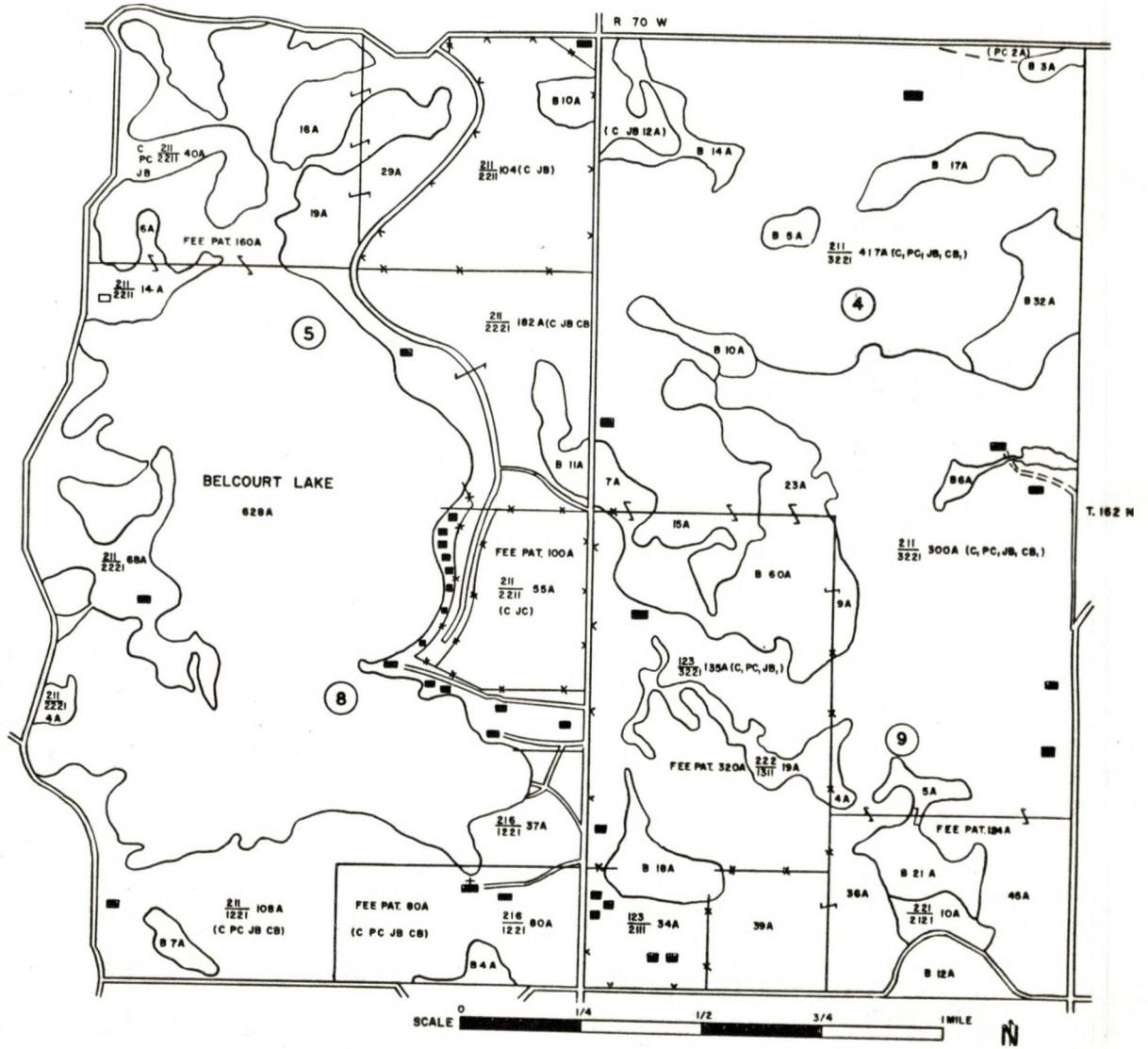
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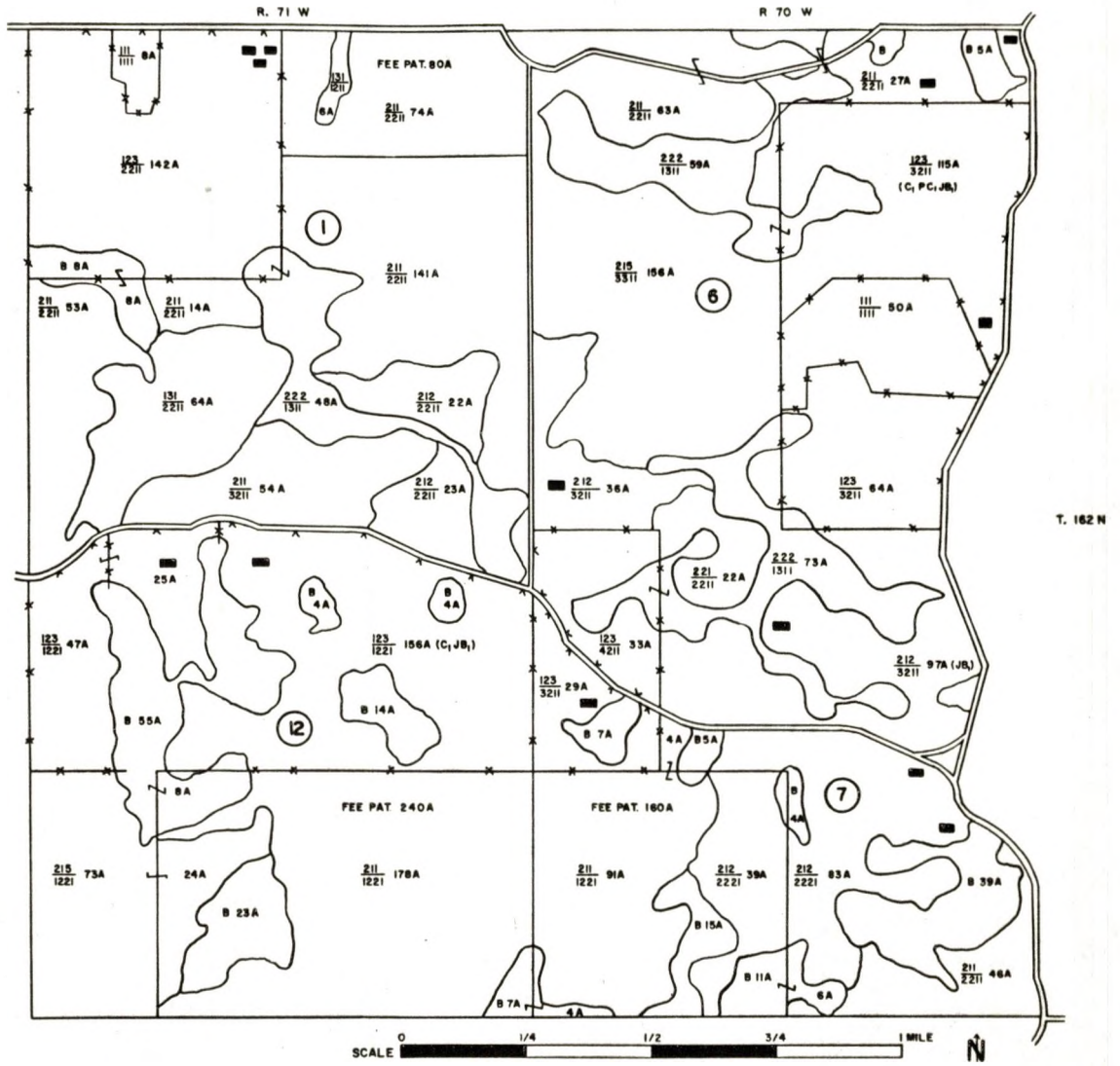
Farm Boundary	
Fence Line	
Field Number	
Fence along Highway	
Public Road	
Private road or Lane	
Connecting Areas	
Farm Buildings	
Abandoned Farm Buildings	
School	
Church	
Gravel Pits	GP
Streams, Intermittent	
Well-all types	

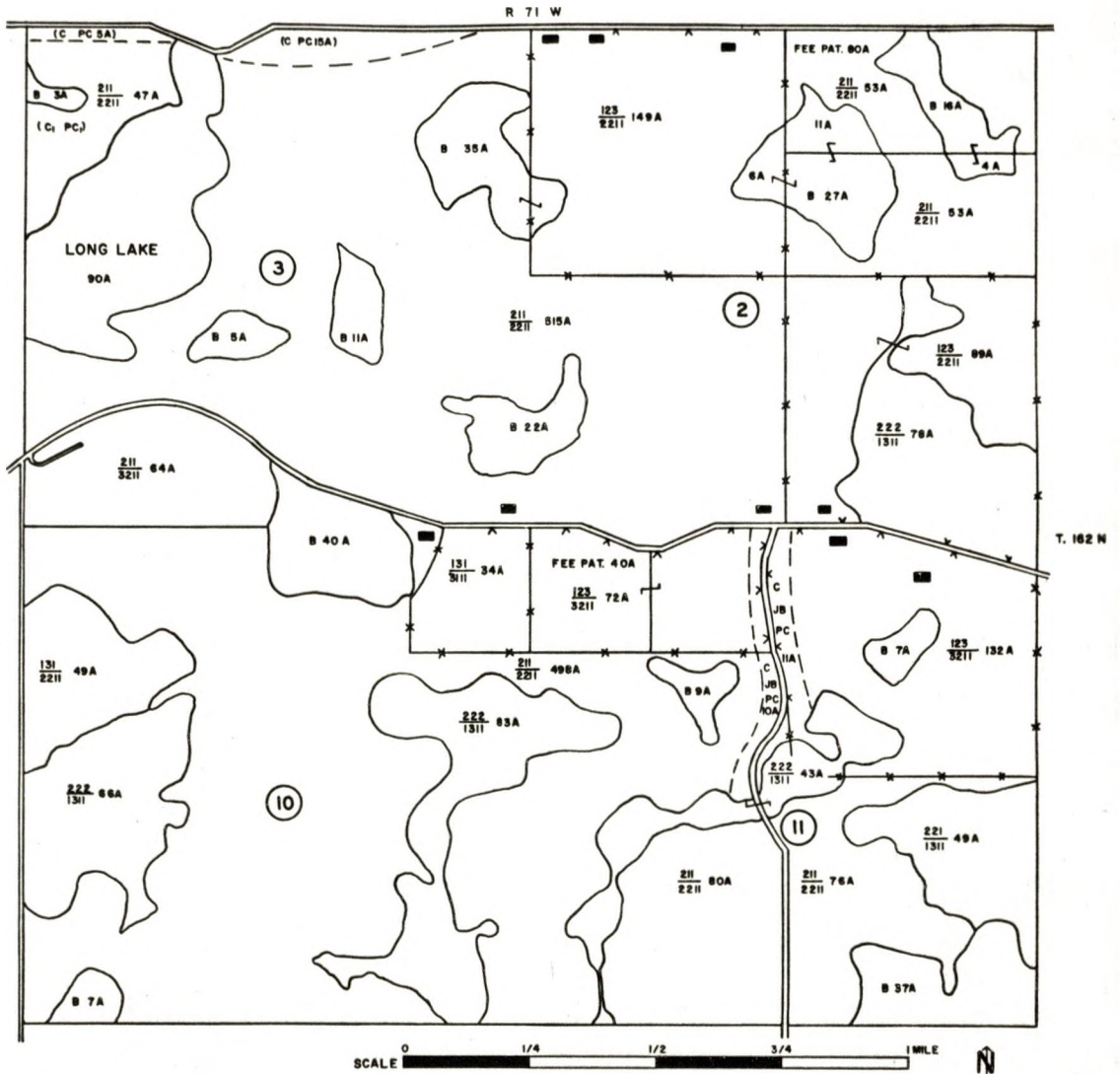


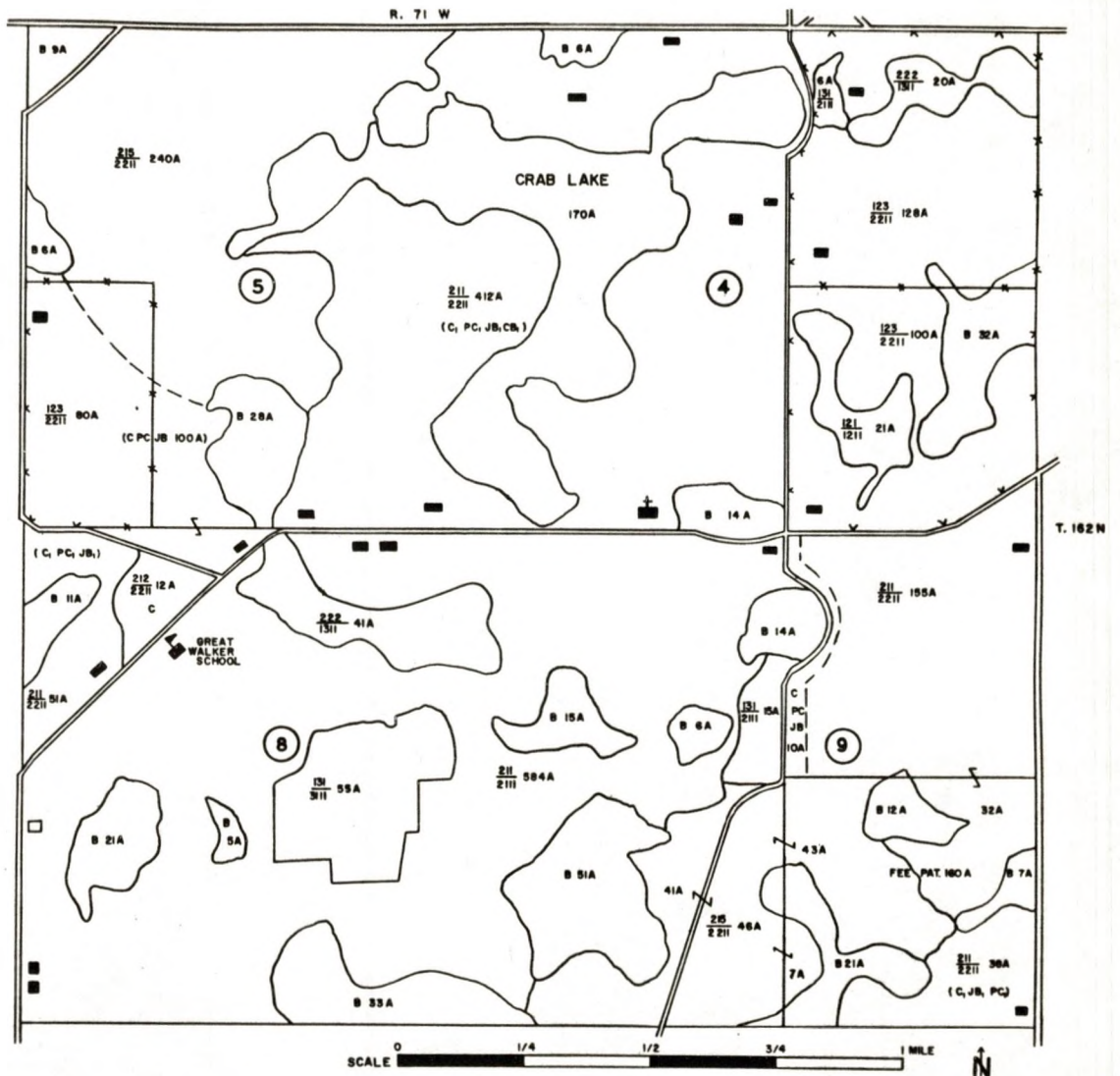


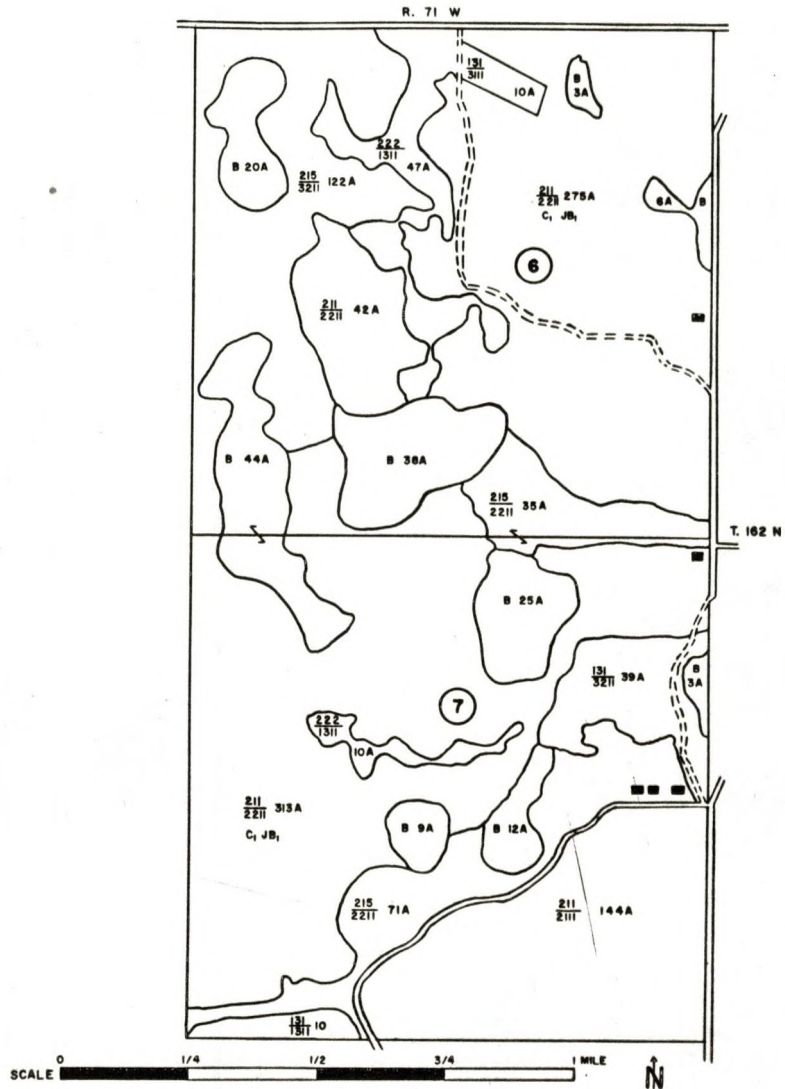


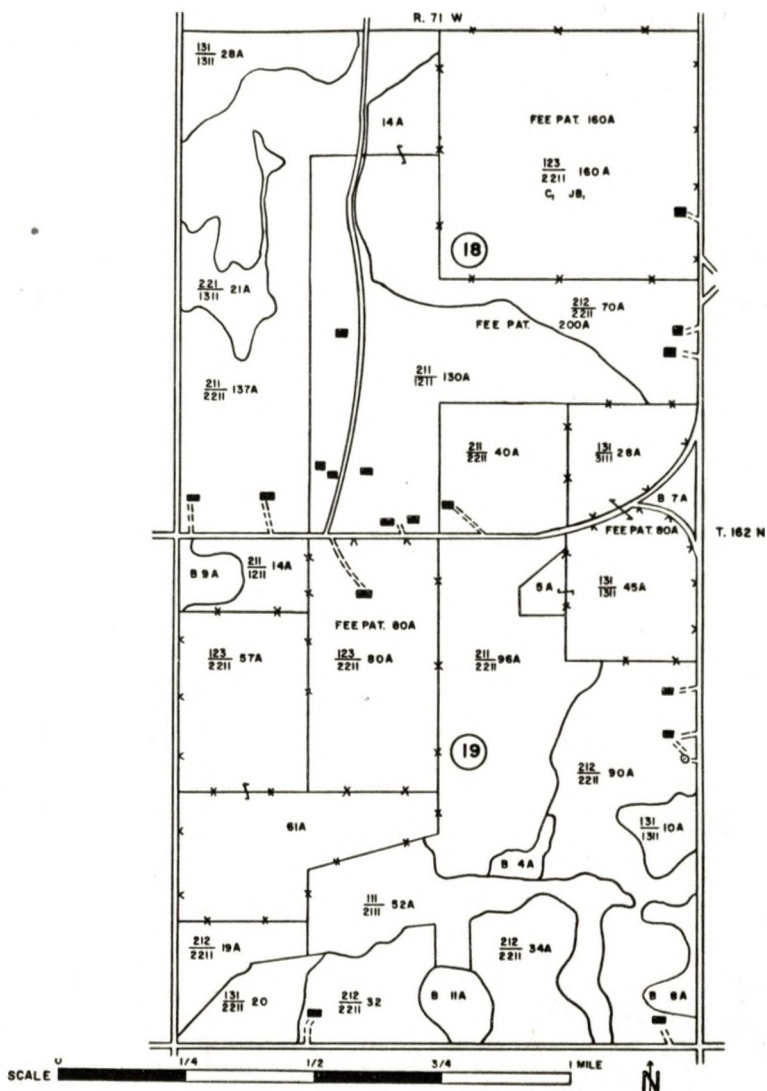




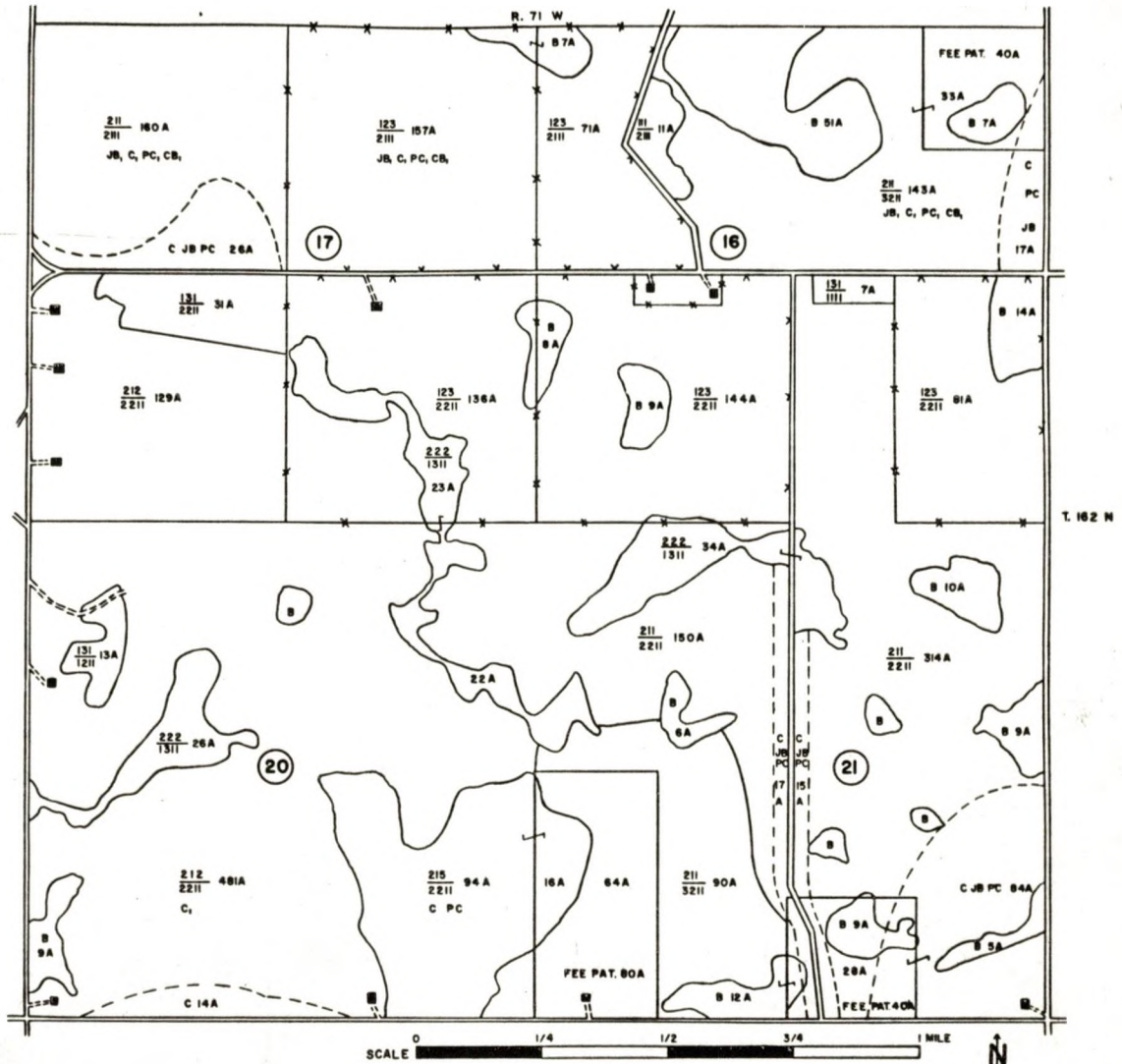


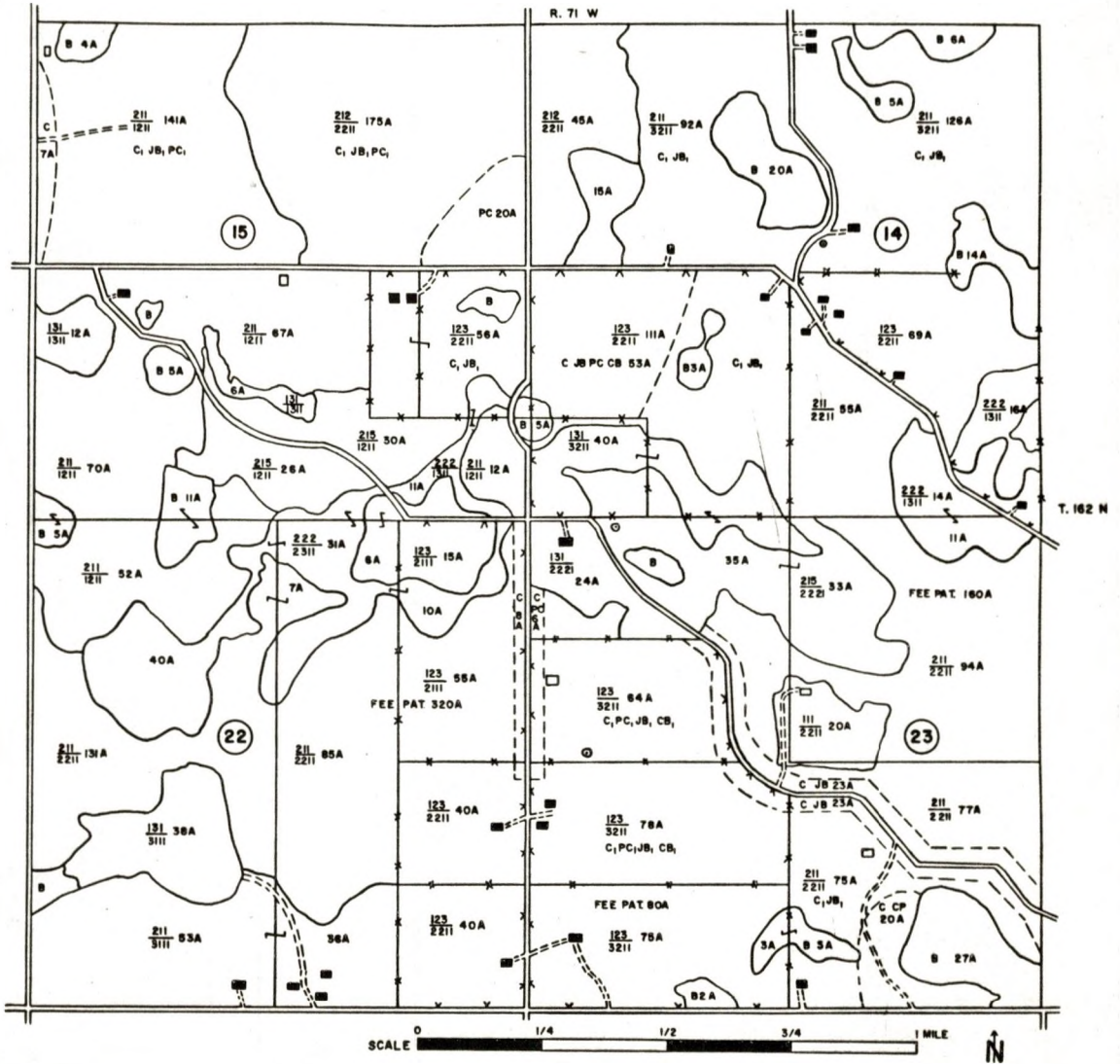


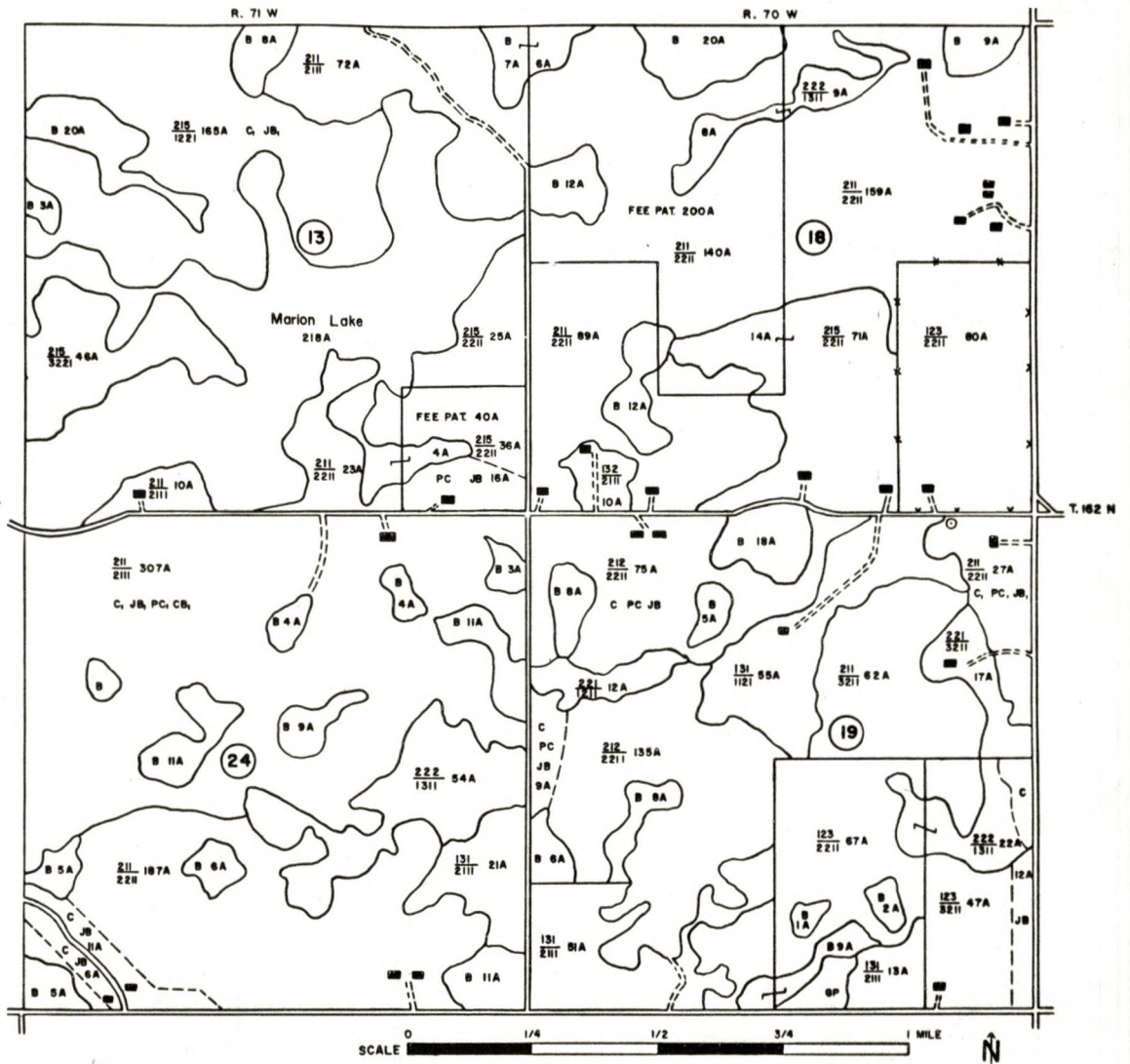






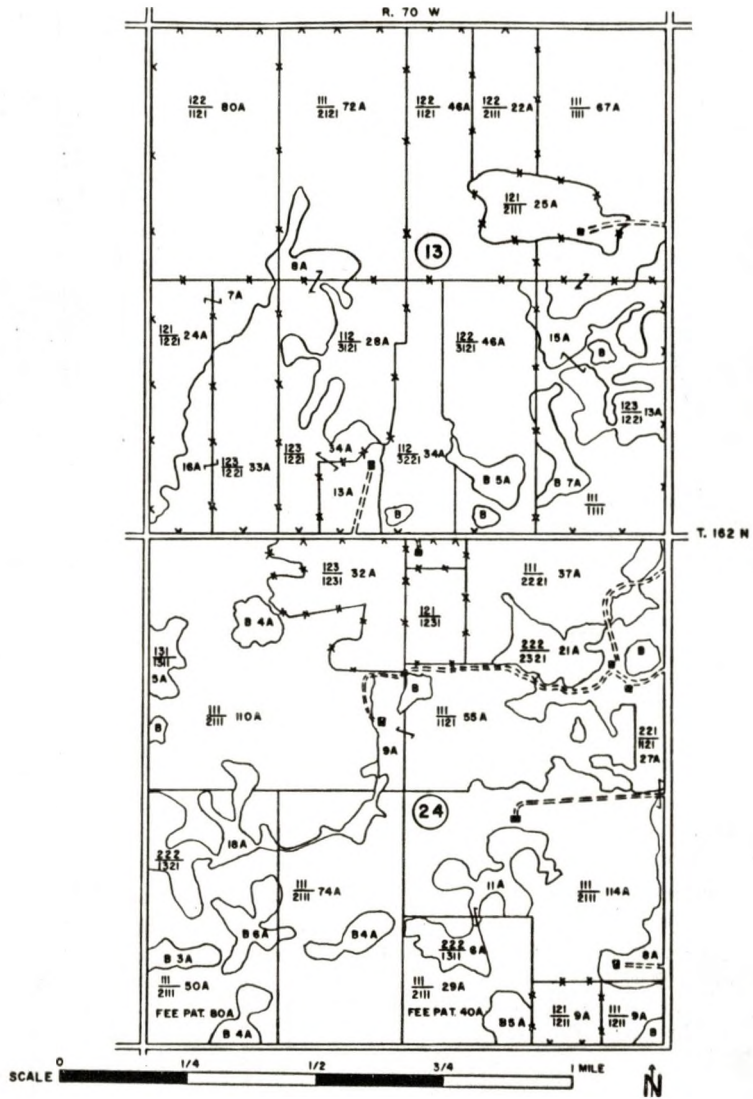


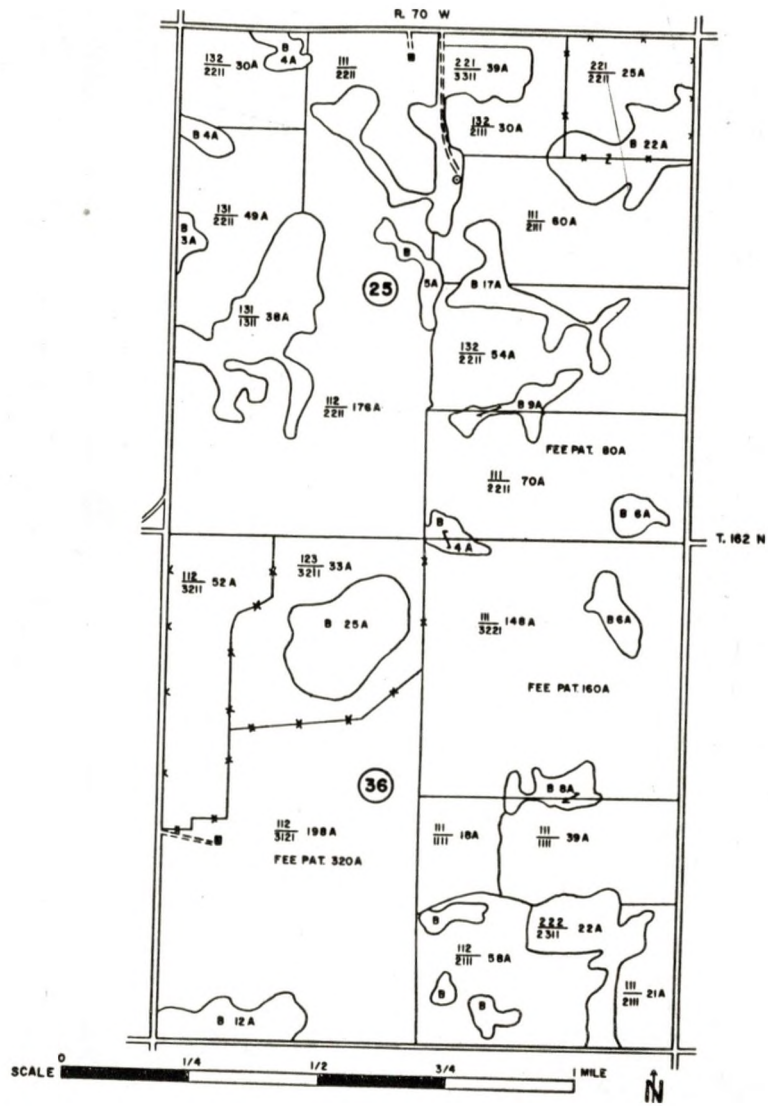


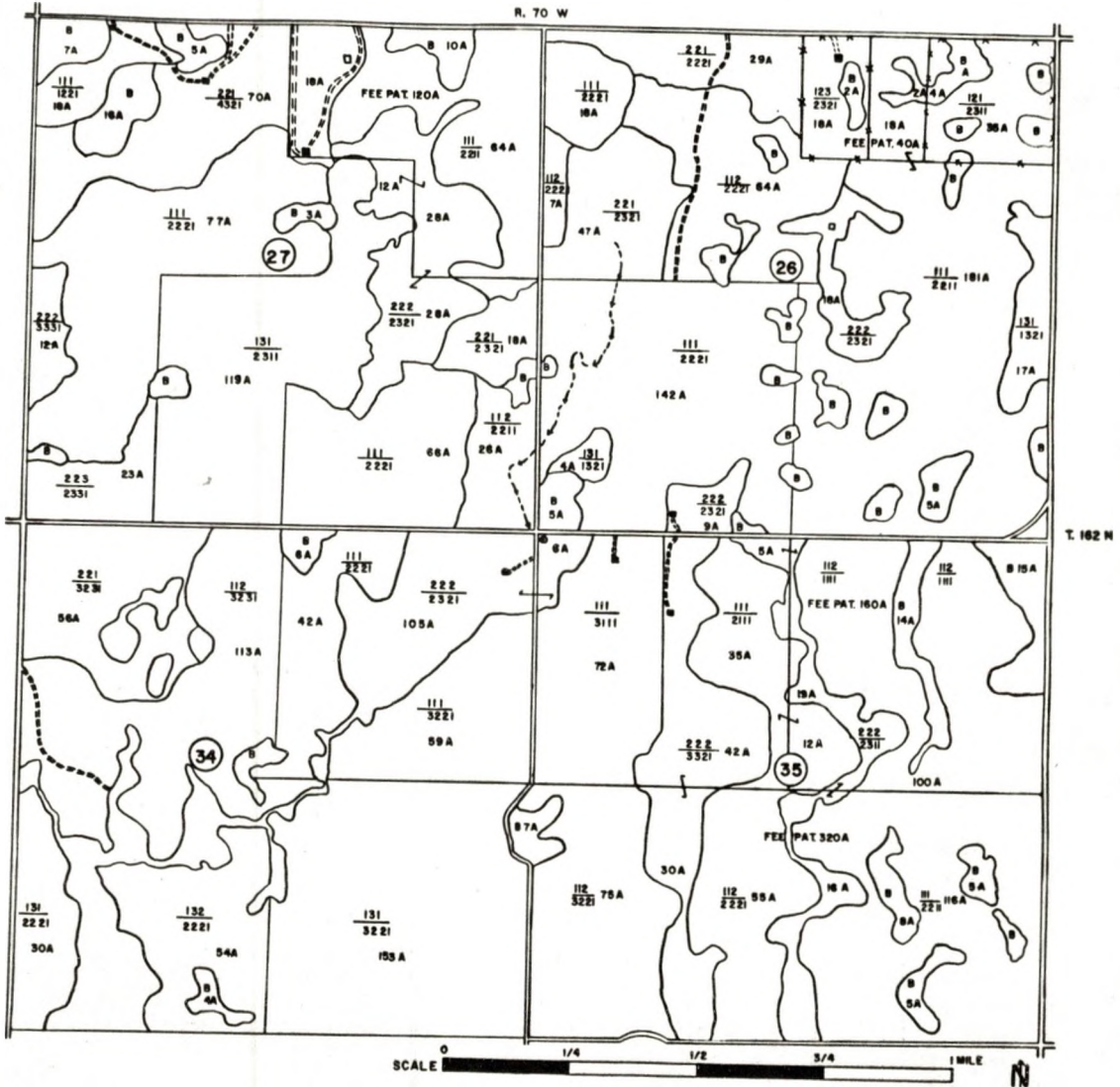




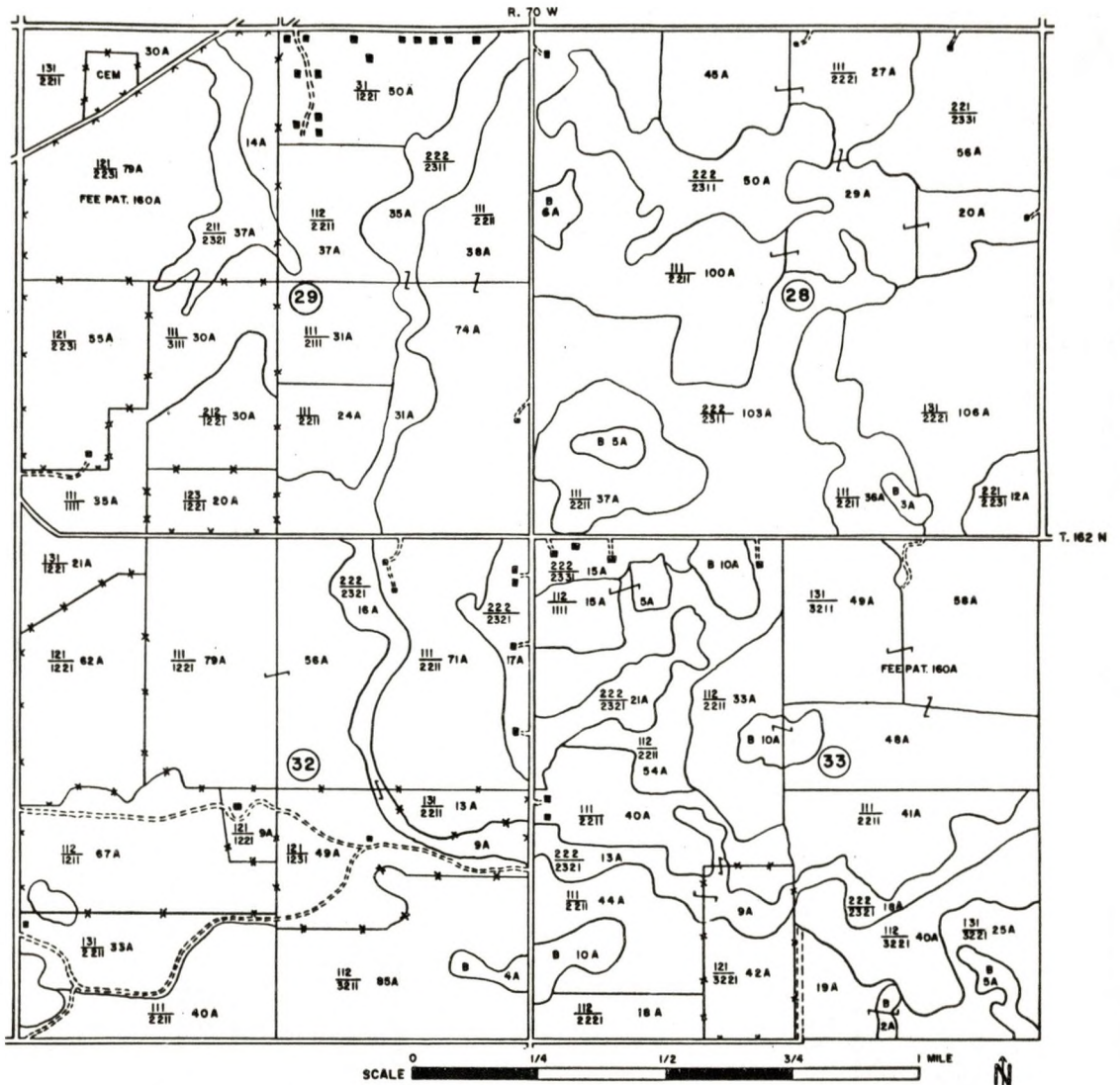


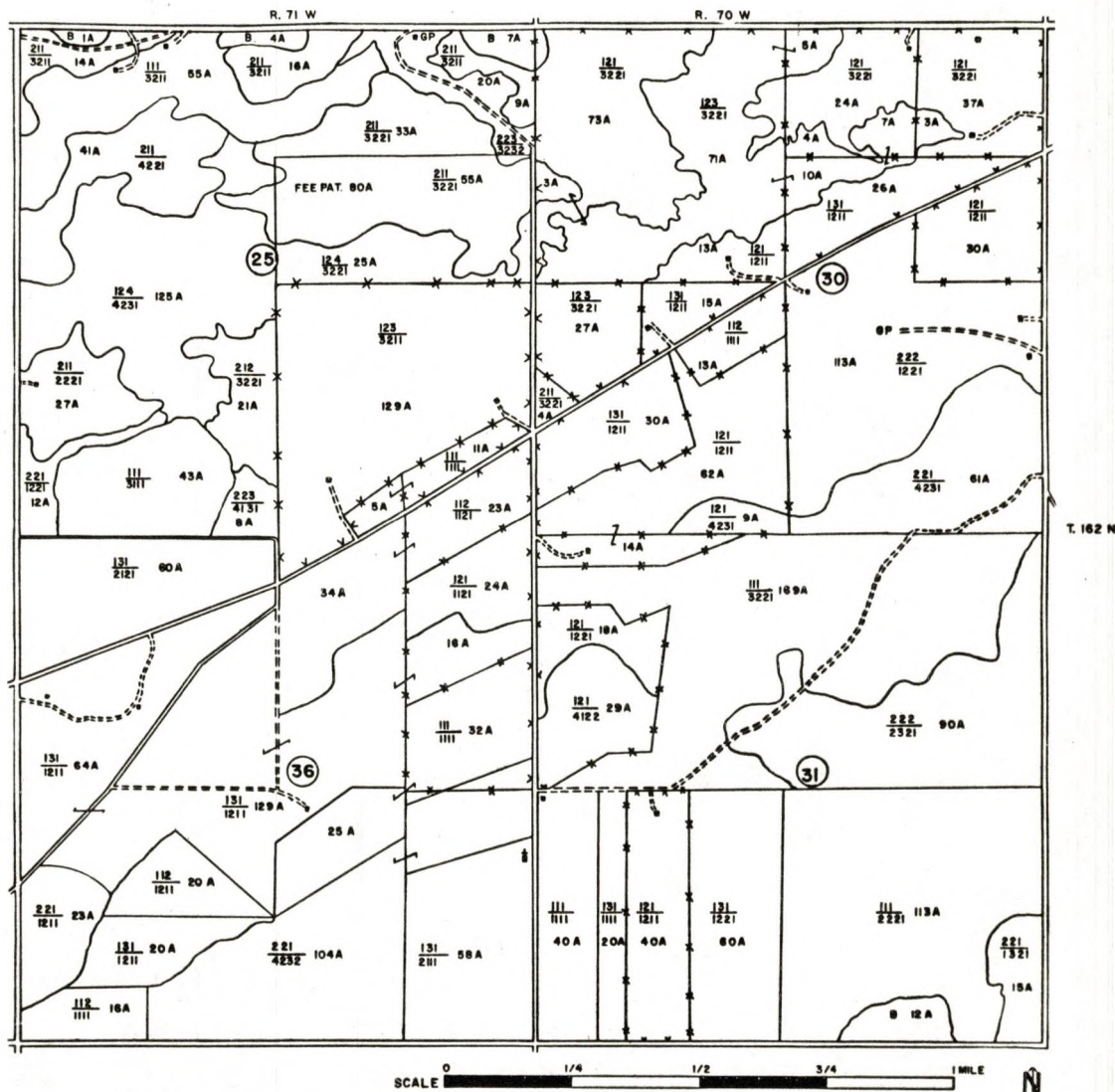


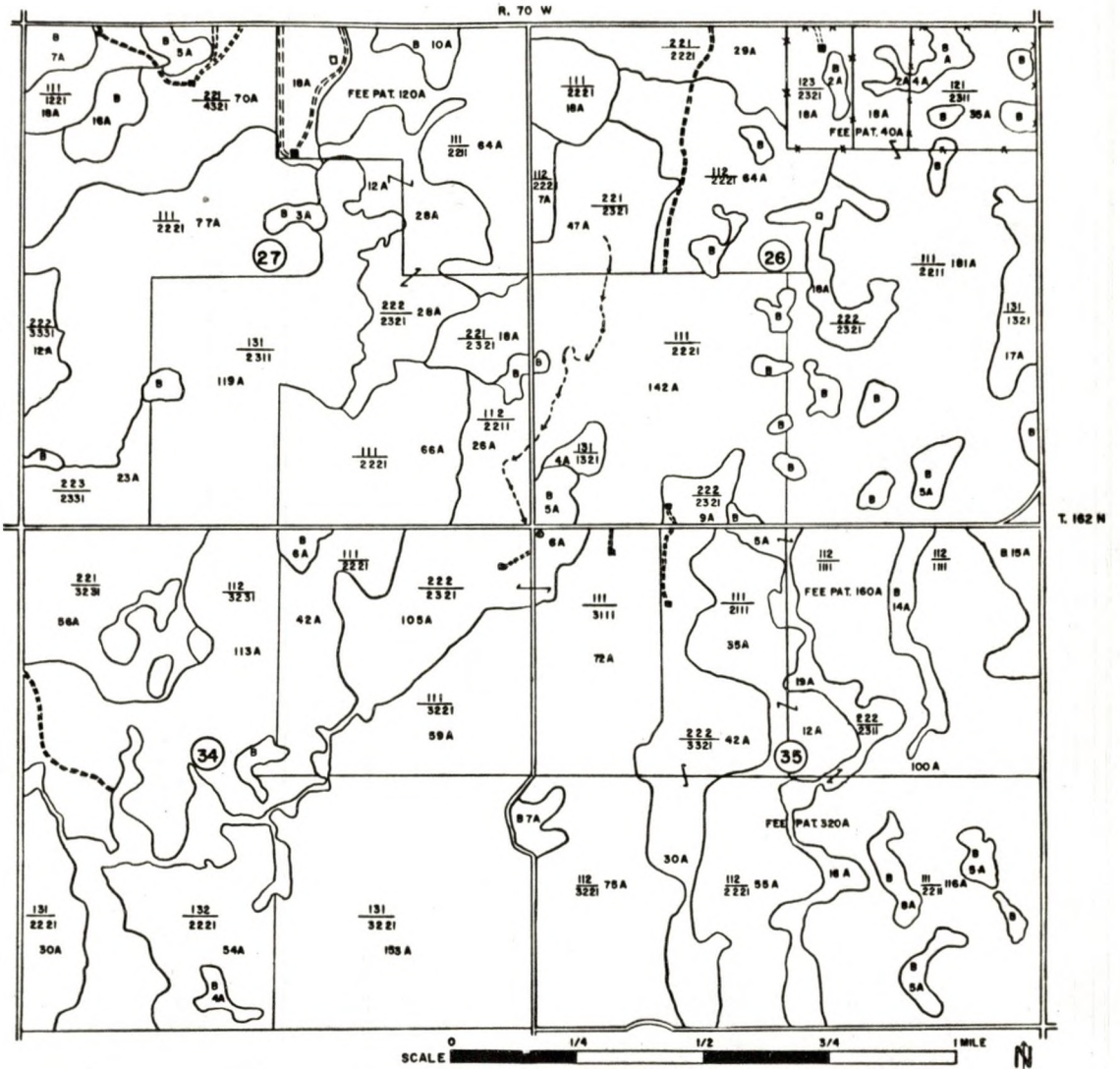


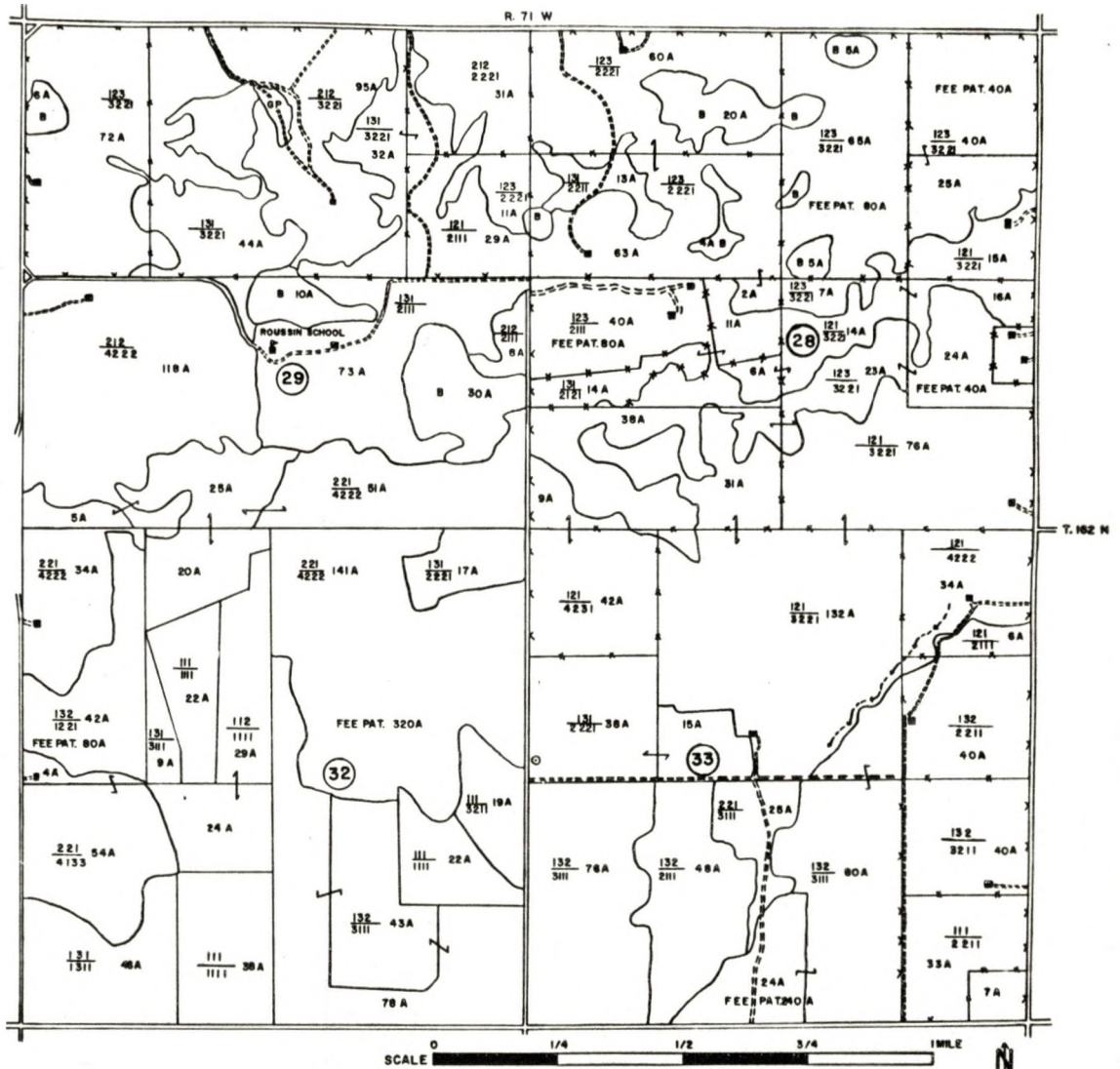


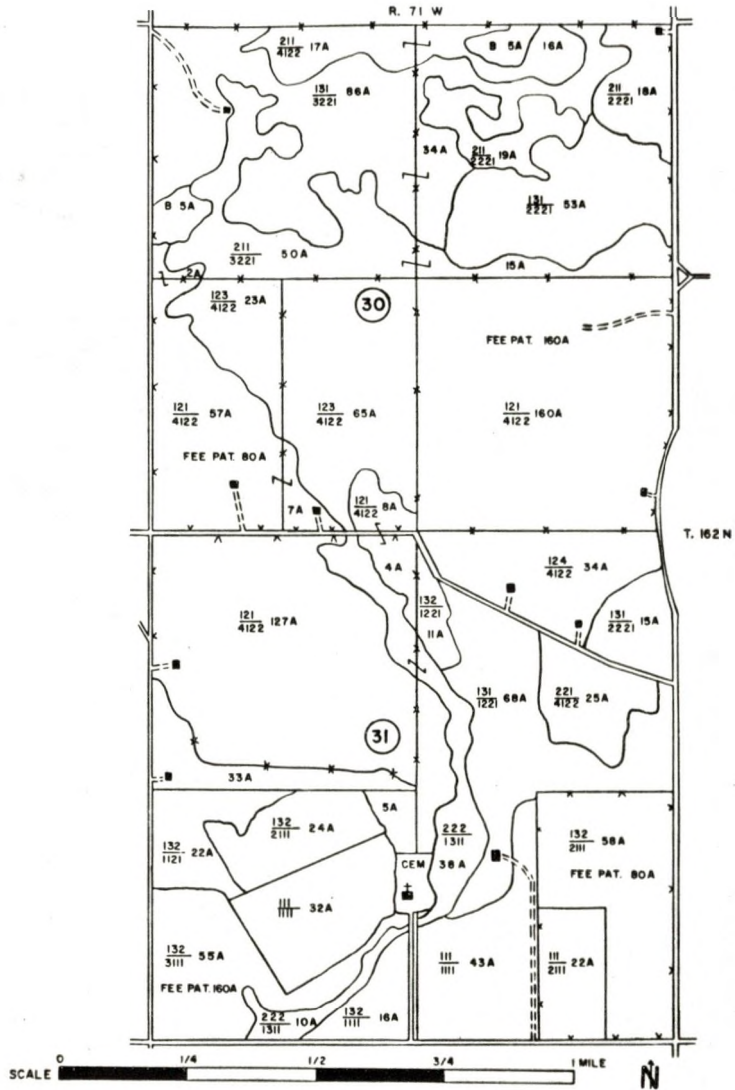












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