Minnesota Natural Resources Department: Environmental Assessment Files Regarding State Parks

ENVIRONMENTAL ASSESSMENT
LAKE BRONSON STATE PARK

I. DESCRIPTION OF THE PROPOSED ACTION

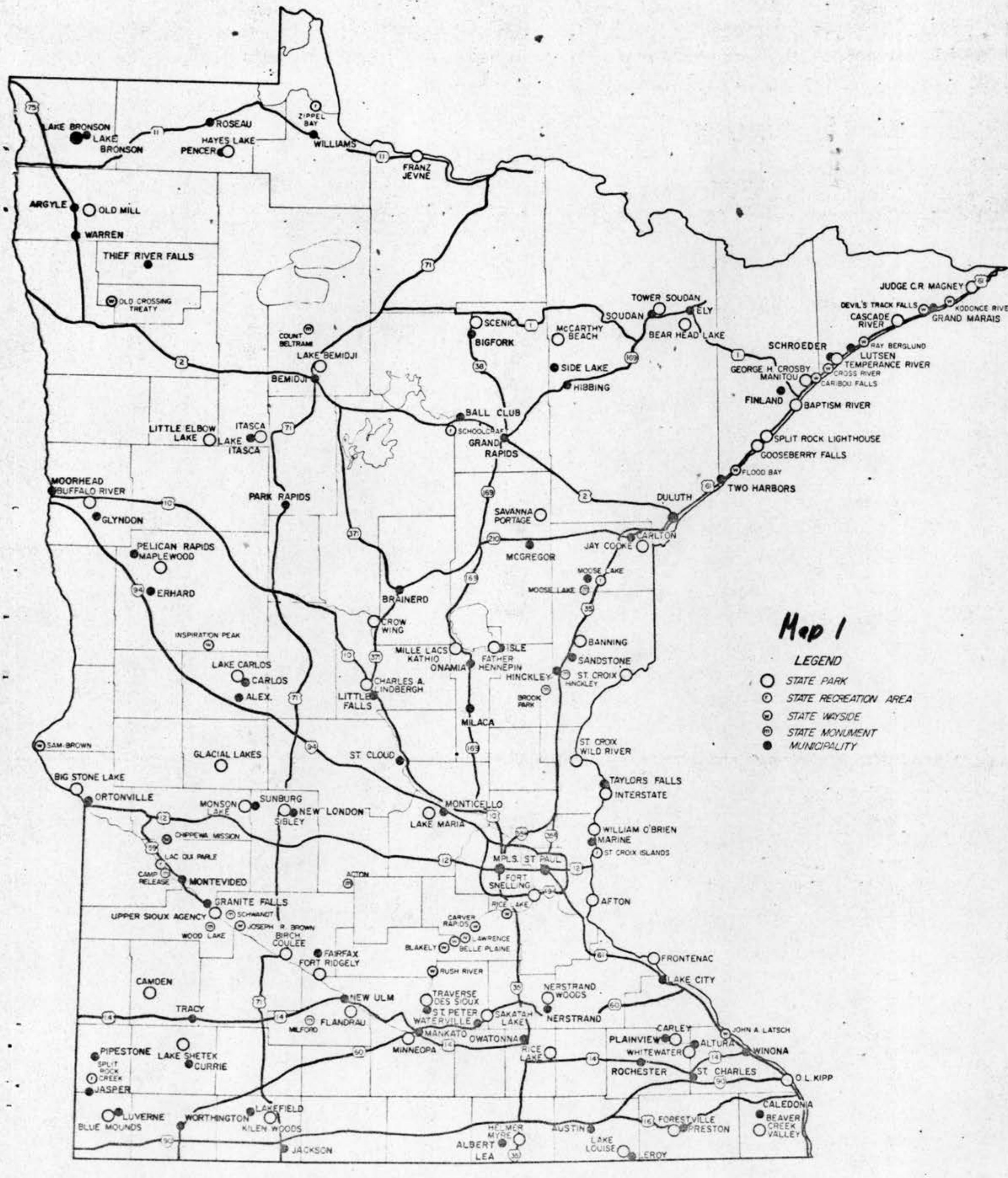
A. Purpose of the Action - Lake Bronson State Park was established by an act of the Minnesota State Legislature in 1937.

The acquisition and development of private land within the authorized park boundary, by the Minnesota Department of Natural Resources - Division of Parks and Recreation, will provide public land for additional outdoor recreational opportunities for park users. Such action will also result in a single land use within the park boundary, thereby making it a much more manageable unit.

The Federal Bureau of Outdoor Recreation, as administrator of the Land and Water Conservation Fund (LAWCON), proposes to participate with the State of Minnesota in this action.

B. Location and Magnitude of the Project - Lake Bronson State Park is located in southeastern Kittson County, Minnesota (Map 1 and 2), 2 miles east of the town of Lake Bronson.

Authorized acreage at the time of establishment was 894. Boundary expansions since that time have increased the statutory acreage to its present 3,031 acres, (Map 1-Appendix). Fifty parcels are presently in private ownership within the park. These parcels total 1,329 acres (44%) of the total authorized acreage. The Department of Natural Resources proposes that this private acreage be acquired with assistance of the LAWCON funds. The current estimated cost for immediate and complete acquisition of these 50 tracts is $375,000 (does no include the cost of relocating 2 permanent and 22 seasonal households). A listing of the tracts to be acquired with this application is included in the appendix.


LEGEND
STATE PARK
STATE RECREATION AREA
STATE WAYSIDE
STATE MONUMENT
MUNICIPALITY
LAKE BRONSON
LAKE BRONSON
ROSEAU
HAYES LAKE
PENCER
ZIPPEL BAY
WILLIAMS
FRANZ JEVNE
ARGYLE
OLD MILL
WARREN
THIEF RIVER FALLS
OLD CROSSING TREATY
COUNT BELTRAMI
LAKE BEMIDJI
BEMIDJI
SCENIC
BIGFORK
McCARTHY BEACH
SIDE LAKE
HIBBING
TOWER SOUDAN
SOUDAN
ELY
BEAR HEAD LAKE
JUDGE C.R. MAGNEY
DEVIL'S TRACK FALLS
KODONCE RIVER
GRAND MARAIS
CASCADE RIVER
RAY BERGLUND
SCHROEDER
LUTSEN
TEMPERANCE RIVER
GEORGE H. CROSBY MANITOU
CROSS RIVER
CARIBOU FALLS
FINLAND
BAPTISM RIVER
SPLIT ROCK LIGHTHOUSE
GOOSEBERRY FALLS
FLOOD BAY
TWO HARBORS
LITTLE ELBOW LAKE
ITASCA
LAKE ITASCA
BALL CLUB
SCHOOLCRAFT
GRAND RAPIDS
MOORHEAD
BUFFALO RIVER
GLYNDON
PARK RAPIDS
SAVANNA PORTAGE
DULUTH
CARLTON
JAY COOKE
McGREGOR
PELICAN RAPIDS
MAPLEWOOD
ERHARD
BRAINERD
MOOSE LAKE
MOOSE LAKE
CROW WING
INSPIRATION PEAK
MILLE LACS KATHIO
ISLE
ONAMIA
FATHER HENNEPIN
BANNING
SANDSTONE
LAKE CARLOS
CARLOS
ALEX.
CHARLES A. LINDBERGH
LITTLE FALLS
HINCKLEY
ST. CROIX
HINCKLEY
BROOK PARK
MILACA
SAM BROWN
GLACIAL LAKES
ST. CLOUD
ST. CROIX WILD RIVER
BIG STONE LAKE
ORTONVILLE
TAYLORS FALLS
INTERSTATE
MONSON LAKE
SUNBURG
SIBLEY
NEW LONDON
MONTICELLO
LAKE MARIA
WILLIAM O'BRIEN
MARINE
ST. CROIX ISLANDS
CHIPPEWA MISSION
LAC QUI PARLE
CAMP RELEASE
MONTEVIDEO
ACTON
MPLS.
ST. PAUL
FORT SNELLING
AFTON
GRANITE FALLS
UPPER SIOUX AGENCY
SCHWANDT
WOOD LAKE
JOSEPH R. BROWN
RICE LAKE
CARVER RAPIDS
LAWRENCE
BLAKELY
BELLE PLAINE
BIRCH COULEE
FAIRFAX
FORT RIDGELY
RUSH RIVER
FRONTENAC
LAKE CITY
CAMDEN
NERSTRAND WOODS
TRACY
NEW ULM
TRAVERSE DES SIOUX
ST. PETER
WATERVILLE
SAKATAH LAKE
NERSTRAND
MILFORD
FLANDRAU
MANKATO
OWATONNA
JOHN A. LATSCH
CARLEY
PLAINVIEW
ALTURA
WINONA
PIPESTONE
SPLIT ROCK CREEK
LAKE SHETEK
CURRIE
MINNEOPA
RICE LAKE
WHITEWATER
ROCHESTER
ST. CHARLES
O.L. KIPP
JASPER
LUVERNE
BLUE MOUNDS
WORTHINGTON
LAKEFIELD
KILEN WOODS
HELMER MYRE
AUSTIN
FORESTVILLE
PRESTON
CALEDONIA
BEAVER CREEK VALLEY
ALBERT LEA
LAKE LOUISE
LEROY
JACKSON
75
11
2
71
169
38
1
61
10
94
371
210
65
35
37
12
59
14
60
90
16
52
36

Map 1


GENERAL HIGHWAY MAP
KITTSON COUNTY
MINNESOTA
ISSUED BY THE
MINNESOTA DEPARTMENT OF HIGHWAYS
IN COOPERATION WITH THE
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
BUREAU OF PUBLIC ROADS
DATA OBTAINED AND MAP PREPARED BY THE
PLANNING AND PROGRAMMING DIVISION
OFFICE OF
TRANSPORTATION PLANNING
SCALE OF STATUTE MILES
1969
BASIC DATA 1962
Map 2
LEGEND
C A N A D A
M A N I T O B A
NORTH DAKOTA
RED RIVER
CLOW
RICHARDVILLE
ST. VINCENT
ST. JOSEPH
McKINLEY
CARIBOU
HAMPDEN
GRANVILLE
HILL
POPPLETON
CANNON
NORTH RED RIVER
HALLOCK
THOMPSON
HAZELTON
PERCY
SOUTH RED RIVER
SKANE
TEGNER
JUPITER
NORWAY
PELAN
TEIEN
SVEA
DAVIS
RING BROOK
DEERWOOD
ARVESON
HUMBOLDT
HALLOCK
KENNEDY
LAKE BRONSON
HALMA
KARLSTAD
DONALDSON
PEMBINA
DRAYTON
WALSH CO.
M A R S H A L L
Noyes (1)
Northcote (2)
Orleans (3)
Inset (4)
LAKE BRONSON STATE PARK

C. Timing of the Project - The State Park System contains approximately 53,000 acres of privately owned lands within its statutory boundaries. The proposed action is part of the initial step of a major, six year (1976-1982) statewide acquisition program which was designed to acquire most of this remaining acreage.

Completion of this statewide acquisition objective is estimated to cost more than $43 million. Acquisition goals for the initial step (1976-77 biennium) of the program were set at approximately 12,000 acres. Appropriations to meet these goals totaled $9.5 million.

The Division of Parks and Recreation has established its land acquisition priorities for each park, but completion of these priorities is completely dependent upon willing land sellers.

The immediate and complete acquisition of the 50 tracts within Lake Bronson State Park is impossible since the Division of Parks and Recreation does not have the power of eminent domain. Secondly, the estimated acquisition cost of $375,000 would be prohibitive within current appropriation limitations.

The acquisition goal for the initial step of the major program for Lake Bronson State Park was set at 100.25 acres (42 tracts). Thirty-eight of these tracts are part of the Lakeside Subdivision. The current estimated cost for this acreage is $88,800. Fourteen of these tracts have recently been appraised.

D. Future Development - An inventory of the natural resources of the park is currently in progress. This inventory is part of a long range comprehensive management plan for the park. The plan itself is scheduled to be completed by June 30, 1977. If not completed by this date, further developments in the park will not proceed after August 1, 1977, or until the plan has been completed.

Future developments will depend upon results of the current natural resources inventory. From existing preliminary development plans, future developments could include: Phasing out the present campground and utilizing this area to expand the present picnic area, located adjacent to the swimming beach, and expanding the new campground which is located about 1 mile east of the present one. Other new developments may include a group picnic area, group camp (with boat landing), and unimproved campground, a primitive campground, a trail center, and a service area. The access roads and supporting facilities, such as sewage and water, necessary to properly serve these sites will also be developed. Future developments will also include expansion of the current trail system.

Current biennium developments will be closely coordinated with the planning staff conducting the natural resources inventory so that such developments are consistent with the long range comprehensive plan.

E. Recreational Needs to be Served by the Proposal - Lake Bronson State Park is located in Economic Development Region 1 (Map 3), a 7 county area of northwestern Minnesota. The 1974 Minnesota State Comprehensive Outdoor Recreational Plan (SCORP) identified existing recreational facilities within this region and projected the future facility deficits:

	1975	1980	1990
Picknicing (no. of tables)	-184	-186	-191
Camping (no. of campsites)	-401	-522	-721
Trails (no. of miles)	- 64(hiking)	*	*
	-382(snowmobile)	*	*
Swimming (sq. ft. of beach)	-100,000	-113,000	-139,000

* No projection made

Information from the park on recreational use shows that the total visitor attendance has increased about 3-fold from 1965-1975.

Year	Organized Youth Camps	Tourist Camps	Day Visitors	Total Visitors
1956	446	733	54,470	55,049
1960	---	------	-------	76,750
1965	---	7,280	61,560	68,840
1970	2,442	18,415	162,937	183,794
1971	---	26,207	171,386	197,593
1972	---	31,913	235,722	267,635
1973	---	28,132	215,341	243,473
1974	13	30,237	223,920	254,170
1975	13	33,005	180,470	213,488

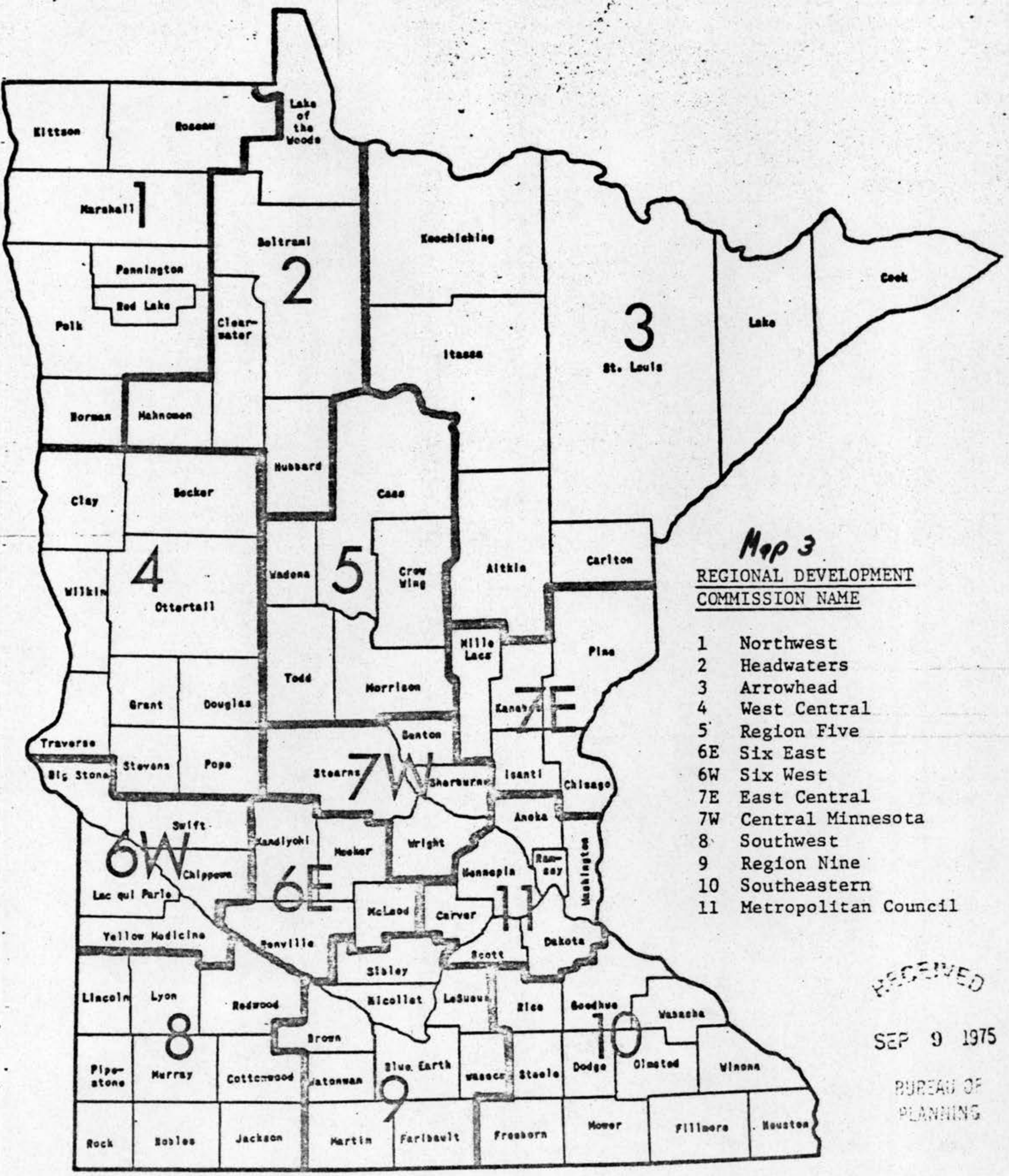
Projected usage estimates are not available, but from looking at the past user data, and considering the greater amount of leizure time which will become available, the demand for such recreational facilities will very likely increase.

Some of the present park facilities are at or near maximum use. Without further development, these facilities will suffer from overuse.

II. DESCRIPTION OF THE ENVIRONMENT

A. Topography - The present topography for Lake Bronson State Park is the result of former glacial forces. At its greatest depth glacial Lake Agassiz extended to the east of the present Lake of the Woods. As the glacial melt-waters receded northward, wind and wave action piled up continuous ridges of gravel. Five major stages of recession of the lake resulted in the formation of five groupings of these ridges. Each ridge is characterized by a generally slight rise in topographic relief up to the western edge of the ridge and then a slight depression just behind it. The park is located on the most westerly of the five ridges. Overall topographic relief is from flat to gently rolling.

Minnesota Development Regions



Map 3

REGIONAL DEVELOPMENT COMMISSION NAME

1	Northwest
2	Headwaters
3	Arrowhead
4	West Central
5	Region Five
6E	Six East
6W	Six West
7E	East Central
7W	Central Minnesota
8	Southwest
9	Region Nine
10	Southeastern
11	Metropolitan Council

State Planning Agency
Office of Local & Urban Affairs
9/30/74

B. Soils - Soils in the area belong to the general soils group which contains coarse to fine textured prairie soils and organic soils of glacial lake plains.

Specific soil associations characteristic to the park include the Blown Out Land, Poppleton, Maddock, and Cormont. These soils are generally sandy in texture, show little development, are moderately to well drained, and are low to moderate in organic matter content and fertility.

C. Climate - Mean January temperatures are 12°F (maximum) and -10°F (minimum). Maximum July temperatures average 82°F while the minimum averages 56°F.

Total annual precipitation is generally light, averaging 20 inches. Approximately 18 percent of this total occurs as 31 inches of snowfall.

Such climatic conditions make the park ideal for year-round outdoor recreational activities including such winter time activities as cross-country skiing, snowmobiling and ice fishing.

D. Water Resources - The surficial water resource is a very important feature of the park because of the lack of such resources in the region. Lake Bronson was created during the 1930's by constructing a dam across the South Branch of the Two Rivers near the west end of the park. The present impounded lake is 318 acres in size, has a maximum depth of 32 feet and a very irregular shoreline. These physical characteristics make the lake suitable for a variety of water oriented recreational activities. Approximately 3 1/2 miles of the Two Rivers meanders through the park above and below the Lake.

Sub-surface water resources appear to be in good supply. Important acquifers within the gravel drift are located in a series of outwash deposits that range in thickness from near zero to 280 feet and fill a north-south trending valley.

E. Mineral Resources - The probability of economic concentrations of uranium and copper occurring in the park is listed as low. The geologic reliability of such occurrences is listed as fair.

The old beach lines (ridges) of former glacial Lake Agassiz contain some very good deposits of sand and gravel. Extraction of these resources has been and remains economically feasible in areas of the park.

F. Flora - The original vegetation of the park was mainly an upland prairie, with some aspen-oak land, brush prairie and wet prairie. Fire, both natural and man-made, was a major factor in preventing the encroachment of the forest, and in maintaining the diversity and productivity of the prairie. As fire became less of a factor in the pattern of natural succession, forest floral types such as the aspen-oak and brush prairie were able to expand onto the prairie.

The current abundance and distribution of floral species is somewhat changed from both the original and post fire compositions. Major plant communities present in the park today include the mature pioneer hardwoods, consisting mainly of aspen with some bur oak. Wolfberry, wild rose and Juneberry are important species of the open brush community. Man-made monotypic communities on the agricultural lands are mainly hay and small grains, while potatoes are grown on some agricultural lands where water for irrigation is available.

Another important plant community is the open field. These were formerly agricultural lands which have been abandoned and left to natural succession. Species present include bluegrass, bromegrass and a variety of herbaceous species.

G. Fauna - Included in the appendix are listings of the various species of fauna whose geographic ranges include the park. These listings include species which may occur either permanently, seasonally, during periods of migration or are only occasional visitants. Some of the species may not occur every year.

Species included on these lists which the State of Minnesota lists as meriting special consideration and management are: The sandhill crane, which is classified as threatened; the Cooper and marsh hawks and the Franklin gull, the status of which are changing or uncertain; and the great blue heron and snapping turtle which are listed as species of special interest.

H. Air and Water Quality - No specific air quality data are available. Possible sources of industrial air pollution which could have an adverse effect on the air quality are Winnipeg, 85 miles to the northwest and Thief River Falls, 45 miles to the southeast. Auto emissions from vehicle users of the park are a source of air pollution. Adverse effects from these sources, particularly the former, are minimal.

Although Lake Bronson is classified as a hard-water lake of good fertility, specific water quality is suitable to permit a variety of water related activities including body contact sports.

The ground water quality does meet State Health Department standards for human consumptive purposes.

I. Historical and Archaeological Resources - One site is listed by the Minnesota State Historical Society for the park. This is the Lake Bronson mound site of prehistoric, aboriginal American origin which is located on park owned land in the NW 1/4 S.5, T. 106, R. 46 (Norway Township).

J. Transportation and Utilities - The major access route to the town of Lake Bronson is U.S. Highway 59. Access into the park, approximately 2 miles east of the town is provided by County State Aid Highway 28. This road also provides access to the manager's residence and many of the existing facilities. Park roads provide access to the new campground located at the east end of the lake and to the group campground on the south side of the lake. Approximately 5 miles of unimproved private roads provide access to residences and agricultural fields within the park.

The only commercial passenger transportation service available is to the town of Lake Bronson, which is provided by the Greyhound Bus Company. Commercial railway freight service is also provided to the town by the Soo Line Railroad.

Available utilities to residences and facilities in the park are electricity and telephone.

K. Socio - Economic Factors - The Minnesota State Planning Agency population projections for Kittson County and Economic Development Region 1 show a slight increase for the region and a slight decrease for the county.

Projected Population

	Kittson County	Region 1
1970	7,000	96,600
1980	6,800	96,500
1990	6,700	99,000
2000	6,200	97,800

Based on 1970 population data, the State Planning Agency estimates an employed labor force of 2,383 persons in the county. The economic base of the county is very dependent on agriculture and related fields. Agriculture, forestry and fisheries accounted for 602 (25%) of the labor force; wholesale and retail trades 543 (23%); and professional and related services 475 (20%).

Estimates for 1975 show a total of 2,377 households in the county, each averaging 2.90 persons. Average family income was $7,625 (based on 1970 population data). Twenty-two households are located in the park, only 2 of which are permanently occupied. The remaining 20 are all seasonal cottages located within the Lakeside Subdivision.

Data from 1973, from the Minnesota Crop and Livestock Reporting Service, show 662 farms in the county totaling 511,027 acres or 772 acres/farm. Average farm family size was 3.57 persons. Approximately 350 acres, involving 4 farm operations, of the private lands within the park are tillable. The following figures, also from the Minnesota Crop and Livestock Reporting Service, show the major crops and their yields in Kittson County:

Year	Crop	Acres Harvested	Yield
1973	Wheat	148,700	38.9 bu./acre
1974	Wheat	197,100	28.1 bu./acre
1975	Wheat	210,400	38.4 bu./acre
1973	Oats	29,900	43.0 bu./acre
1974	Oats	19,000	35.2 bu./acre
1973	Potatoes	6,400	180.0 cwt./acre
1974	Potatoes	6,600	185.0 cwt./acre
1973	Hay	44,700	1.3 ton/acre

Year	Crop	Acres Harvested	Yield
1974	Hay	32,900	1.3 ton/acre

Approximate acreage breakdown of the 350 acres of cropland is: Hay (140 acres), potatoes (120 acres), and oats (90 acres). Based on the 1974 yield figures given above, and the 1974 statewide seasonal average prices of $1.65/bu. for oats, $3.43/cwt. for potatoes, and $43.00/ton for hay, the estimated gross income derived form cropland in the park is $89,139 or $255/acre. The gross value of farm products from the county, and sold during 1972 was $20,427,000.

Property taxes levied in Kittson County for 1975 totaled $2,444,081.74. Property owners in Percy Township were levied $10,466.34 of this total and private property owners within the park were levied $1,499.22 of the township total.

Tourist-travel expenditures during 1974 totaled $9,868,000 in Region 1, of which the county received $398,000. These expenditures amounted to 1.2 percent of the gross county sales.

L. Land Use and Development Trends

1. Agriculture - Current agricultural land use within the county is quite diversified. Major crops range from wheat, barley, oats, and sugar beets to potatoes. Principle livestock are beef and sheep with some dairying. The western half of the county is predominantly tillable, while the eastern half, in which the park is located, has scattered fields interspersed with brush and timber.

   Current agricultural land use within the park covers approximately 400 acres, 350 of which are cropland. Only 1 of the 4 farm operations is presently engaged in raising cattle. Most of the remaining 1,329 acres in private ownership which is not being used for agricultural purposes is unused timber or brush land.

The current trend in agricultural practices is toward increasing crop and pasture land acreage. Clearing of considerable acreages of timber and brush lands is occurring in order to increase agricultural acreage.

2. Residential - The 22 residences located in the park comprise about 1.5 percent of the private acreage. Residential development trends in recent years has focused on the acquisition of small rural acreages, especially adjacent to a lake or river, for seasonal or permanent residential purposes. The existence of a number of privately owned, unoccupied lots within the Lakeside Subdivision will likely allow this trend to continue.

3. Commercial/Industrial - No commercial or industrial activities, as such, are located in the park. Two of the four farm operations with land in the park are commercial farm organizations. Although Kittson County has no land use zoning regulations, present shoreland, river and stream zoning regulations will likely prohibit future commercial and/or industrial developments within the park.

M. Existing Recreational Developments - Existing recreational facilities within Kittson County are of very limited extent, Map 1 in the appendix shows such facilities within the park. Most of the few outdoor recreational facilities which are available in the county are located in the park.

Recreational developments present in the park include 2 modern campgrounds (208 total campsites), a primitive camp, a 151 table picnic area with an open picnic shelter, boat access to the lake, a swimming beach and bath house, and 6 miles of foot and snowmobile trails.

III. ENVIRONMENTAL IMPACT OF THE PROPOSED PROJECT

A. Impact on the Physical and Biological Environment - Soil compaction in the high use areas, such as the campgrounds and picnic areas, will be minimal because of the generally sandy texture of soils in these areas. Soil erosion in these areas could be a problem if they are subjected to overuse. This sandy texture of some soils will also impose restrictions on certain facility developments. The location and design of developments will consider specific soil characteristics so as to minimize impacts on the resource. As presently tilled agricultural lands are taken out of production, soils which are susceptible to erosion will be stabilized as revegetation occurs.

Impacts on the water resources, particularly the surficial water resource will be insignificant. Increased recreational use of camping and picnic facilities will require greater amounts of sub-surface water, but this demand should not exceed the existing demand of this resource for potato cropland irrigation purposes.

No impacts on the mineral resources will occur. Extraction of gravel from a small active pit located in the park will continue.

The proposed action will cause impacts, both positive and negative, on the flora and fauna resources of the park. Proposed developments and possible overuse of such developments will have an adverse impact on the floral resource of the park. Natural vegetative succession on existing cropland will help to maintain the diversity of this resource. Positive impacts will exceed negative impacts of the proposal on this resource because of the large difference in acreages committed to each land use.

Direct negative impacts on the fauna resources will be minimal. Indirect negative impacts will result from the loss of habitats from development areas and from additional stress on individuals of some species in close proximity to the high use recreational area. A variety of fauna species will benefit from the action as additional natural habitats become available with abandonment of agricultural habitats. None of the species listed by the State as meriting special consideration and management, and which occur in the park will be adversely impacted.

Abandonment of current agricultural practices resulting in erosion, and runoff will improve water quality. Increased recreational use could have an adverse impact on water quality. Increased auto emissions will cause some deterioration of air quality.

B. Impact on Historical and Archaeological Resources - Since the one site known to exist in the park is located on State owned land, no impact will occur.

C. Impact on Transportation and Utilities - The major access route (U.S. 59) had an average annual daily traffic flow volume during 1974 of 645 vehicles in the vicinity of the town of Lake Bronson. Since access to the park via County State Aid Highway 28 is only 2 miles east of its junction with U.S. 59, expected increases in traffic volume should be within the capabilities of both roadways to handle them. Once access is gained into the park, several park roads disperse the visitors to recreational facility sites.

No impacts will occur to existing commercial transportation facilities.

Electricity and telephone utility services will be reduced. Such facilities currently available to private residences will be removed if they cannot be used for park purposes. The existing utilities which can be utilized by the park, or any such additional utilities which may be necessary for future developments, will be placed underground.

D. Impact on Socio - Economic Factors - An adverse social impact will be the relocation of 22 families. The Division of Parks and Recreation does not have the powers of eminent domain, therefore acquisition of the private lands is completely dependent upon the owners willing to sell. Public Law 91-646 guarantees relocation and replacement housing assistance for those owners willing to sell to the state. Since only 2 of the 22 families permanently reside on their property, relocation of all families should not be a major adverse impact.

Increased park use may result in increased incidence of littering and trespassing on private properties adjacent to the park. However, the limited number of access routes into the park and the low population density of residents within the area will keep such problems to a minimum.

Positive social impacts of the proposal will be increased recreational opportunities for a greater number of people.

The proposal will result in a negative impact for the various government taxing units concerned, because of the loss of lands from the tax rolls. The economic tax loss for each unit is given below (taxes levied for 1975):

	Tax Revenue	Tax Loss	% Loss of Tax Revenue
Percy Twp.	$ 1,499.22	$ 170.16	11.340
School District 353	251,472.92	681.57	0.271
Kittson County	674,496.86	365.03	0.054
Total	$2,444,081.74	$1,216.76	0.049

The only significant tax loss will be for Percy Township and although the percent tax loss is significant the actual dollar amount is not great.

There will also be an economic loss of $89,139 from cropland in the park which will be taken out of production.

Economic benefits to the local economy are being realized by the presence of the park. Using the attendance figures for 1975 (see page 4) and the estimated value of uses, a total estimate of expenditures can be made.

Tourist Camps = 33,005 x 1.3 days* x $3.90/day**	= $167,334.35
Day Visitors = 180,470 x $1.35/day***	= 243,634.50
Total	= $410,968.85

As use of the park and expenditures per unit of use increase, the beneficial impact of the park to the local economy will become more significant.

E. <u>Impact on Land Use</u> - A major impact of the proposed action will be a change in current land use. Agricultural and residential land use in the remaining 1,329 acres of private land will change to a variety of outdoor recreational land uses in public ownership.

Structures and utilities on private lands which cannot be utilized by the park will be sold and removed. Agricultural lands which have been disturbed by man will be managed in a manner necessary to return them to their former condition.

* Dep't of Agric. and Applied Econ., Univ. of Minn.
** Data from Park Camping Permits
*** Principles and Standards for Planning Water and Related Land Resources

IV. MITIGATING MEASURES INCLUDED IN THE PROPOSED ACTION

Recognizing that specific soil associations have limitations for uses of them, developments will be restricted to those associations best suited for that particular project. Flora and fauna resources of any particular site will also be given consideration in the planning of a development so that the impact of such projects on these resources will be minimal.

The necessary sewage facilities to handle increased park useage will be installed so that surface and ground water quality will continue to meet State Health Department standards.

The tax loss to the school district will be mitigated by increasing the State's share of the per pupil unit cost. The tax loss to the township and the county will be partially mitigated by a reduction in services such as police protection. These duties will be assumed by park personnel.

An arrangement may be made to lease tillable land for one or two years following purchase. This allows the lessee to plant the same crop that was on the land the year it was acquired. The use of any chemical herbicide is prohibited the year of purchase. Following harvest of the first year's crop, the land is then disked and dragged and seeded with June grass, perennial rye and fescues. The lessee is then permitted to harvest a hay crop from this land the following year.

If a landowner has planted a crop but is unable to harvest this crop prior to selling the land to the State, an arrangement is made with the owner to harvest the crop at no additional cost to him.

The State will offer a retired landowner, who refuses to sell because of undue hardship, a life tenure on 3 to 10 acres of land surrounding his buildings for residential purposes. This avoids the costs of relocation and also the necessary proceedings for estate probation. This privilege costs nothing to the landowner.

All household owners and tenants who must be relocated are entitled to receive relocation assistance payments and compensation under the Uniform Relocation Assistance and Real Property Acquisition Policies Act.

Although the proposed action will not impact historical and archaeological resources known to exist, an agreement with the State Historical Society requires persons engaged in any type of construction development in the park to watch for such materials. If materials are unearthed these persons are instructed to stop further excavation immediately and report the findings to the State Archaeologist. The State Historic Preservation Officer will then be responsible for determining the appropriate action to be taken.

V. ANY ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED SHOULD THE PROPOSAL BE IMPLEMENTED

The acquisition and any subsequent development will have adverse affects, both direct and indirect on some species of fauna and flora. Increased park use will result in an increased level of littering and trespassing and also of noise and local traffic. Increased park use will also cause some deterioration of the surrounding air quality.

VI. RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF MANS ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

Short-term uses of the environment as they relate to the maintenance and enhancement of long-term productivity are not considered in terms of years. Trade offs of uses are necessary in order to gain certain benefits.

Gains	Losses
1. Public ownership of an additional 1,329 acres of open space to be managed for a variety of outdoor recreational opportunities.	The loss of 1,329 acres of private land, approximately 400 of which are currently being used for agricultural and residential purposes.
2. The revegetation of disturbed private lands to plant communities typical of the area.	The relocation of 22 (2 permanent and 20 seasonal) households.
3. The gain of approximately 400 acres of wildlife habitats for fauna species adapted to such habitats.	The expenditure of an estimated \$375,000 in public funds for private land acquisition.
4. Improvement in water quality by curtailment of erosion and runoff.	The loss of \$1,216.76 or 0.049 percent of the total county tax revenue.
5. Improvement of the local economy resulting from expenditures for the development and operation of the park, and from additional employment and recreational opportunities in the park.	

VIII. ANY IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES WHICH WOULD BE INVOLVED IN THE PROPOSED ACTION SHOULD IT BE IMPLEMENTED

The acquisition of 1,329 acres will result in the permanent conversion of approximately 400 acres currently in agricultural/residential land use into public outdoor recreational land use.

Section 6(f) of the Land and Water Conservation Fund Act requires a commitment to recreational and open space land use before money is granted for acquisition and development. Approval from the Secretary of the Interior is necessary before a change in land use of any LAWCON acquired lands can be made.

The development of permanent facilities such as parking lots and roads will result in a small, but irretrievable, commitment of flora and fauna resources.

The manpower, materials and funds necessary to implement the proposed action will also be irretrievably committed.

VIII. ALTERNATIVES TO THE PROPOSED ACTION

The major alternatives considered for the proposed action were (A) no action, (B) acquisition with no development, (C) project of a smaller scope, and (D) project of a larger scope.

A. No Action - This alternative was considered unacceptable because it would severely limit further recreational facility development. Overuse of existing facilities would result in adverse environmental and social impacts.

B. Acquisition with no Development - Although acquisition would be of both environmental and social benefit, a non-development alternative would negate such benefits for the same reason given in alternative A. Therefore, this alternative was also considered unacceptable.

C. Project of a Smaller Scope - This proposal has been given some consideration. Irrigated potato fields of considerable size are located in the extreme northeastern section of the park. These areas would initially be more costly than non-agricultural lands and are not presently conducive for most recreational purposes. The management necessary to return these lands to their former condition would be costly in terms of both time and money. These lands are also quite remotely removed from existing recreational facilities. Legislative action would be necessary to delete these areas from the boundary.

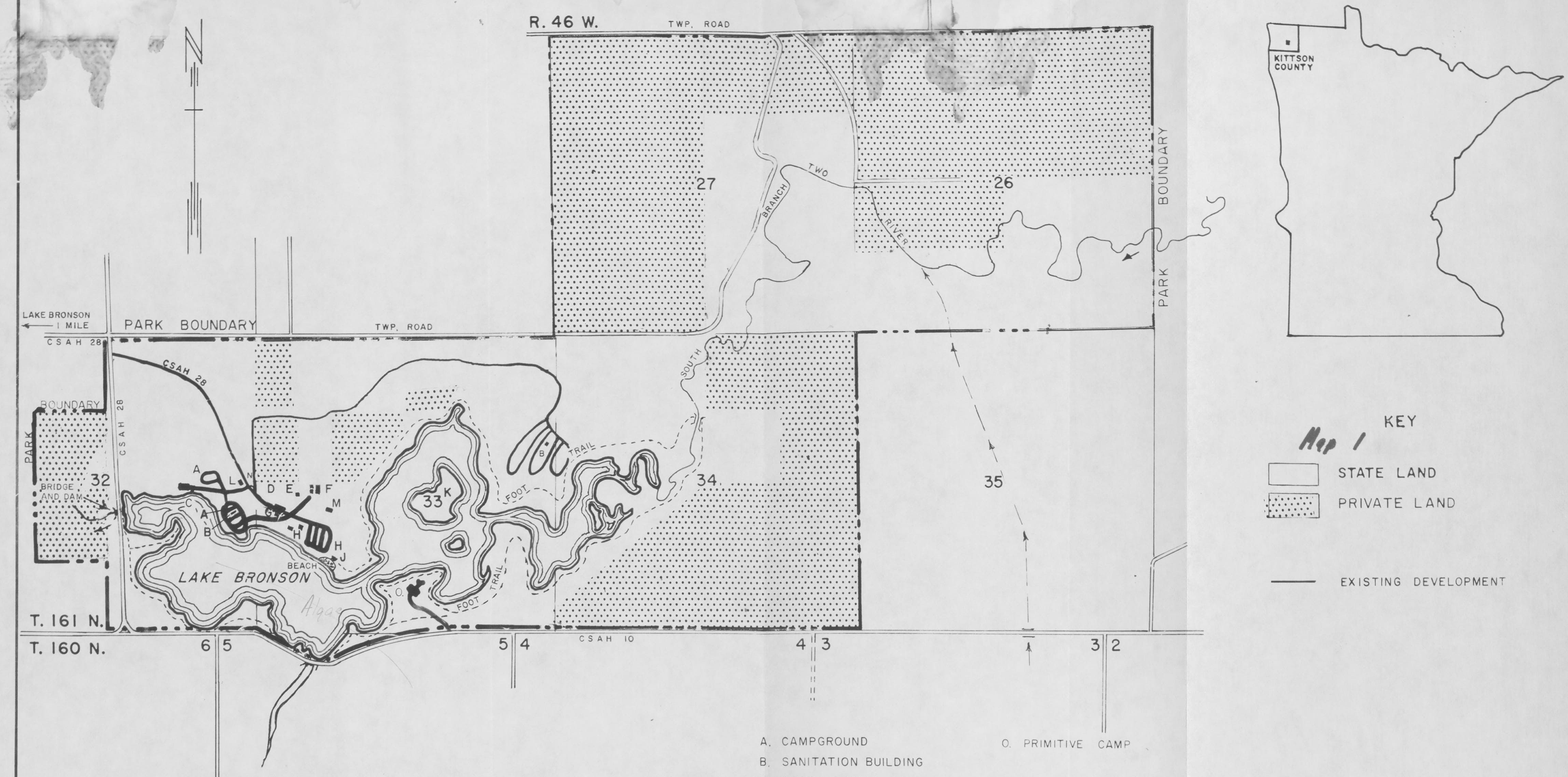
D. Project of a Larger Scope - This alternative has also been given consideration, particularly with respect to Alternative C. A privately owned section of land to the immediate south and east of the present boundary may be available. This land would be cheaper for initial acquisition; appears to remain in a natural condition, thereby requiring little or no management and; is more accessible to the visitors. The Division of Parks and Recreation has shown interest in approximately 300 acres of this section lying west of State Ditch 49. Legislative action is also necessary for boundary expansion.

APPENDIX

Lake Bronson State Park

Tracts to be Acquired with this Application

Tract No.	Owner	Acres	Est. Cost
1	Kittson County	20.00	$ 3,600
2	Baptist Bible Camp	21.50	27,600
21	Ore Ida Foods Inc.	32.02	7,920
13,16,17	Lakeside		
24-59	Subdivision	19.73	48,000
60	Paul Gillie	7.00	1,680
Total		100.25	$88,800



A. CAMPGROUND
B. SANITATION BUILDING
C. BOAT LANDING
D. TEMP. CONTROL STATION
E. WATER TOWER (OBSERVATION TOWER)
F. GARAGE AND SHOP
G. RESIDENCE
H. PICNIC GROUNDS
J. BATH HOUSE
K. BIRD SANCTUARY
L. CONTACT STATION
M. LOG CABIN
N. TRAILER DUMP STATION
O. PRIMITIVE CAMP

SCALE: 3" = 1 MILE
STATUTORY BOUNDARY 2983 ACRES (APPROX.)

MINNESOTA
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF PARKS AND RECREATION
STATE PARK SITE

LAKE BRONSON STATE PARK
KITTSON CO. - NEAR LAKE BRONSON

	T. 160,161 N.	R. 46 W.	5 TH P. M.
DRAWN DAD 3-16-65	BUREAU OF ENGINEERING		SURVEY
CHECKED JAJ 3-25-65			DATUM
REVISED LDS 9-26-75	R. J. Owens 3-26-65 CHIEF ENGINEER		
Ownership Revised RES 10-30-75	REQ. 64-185	SHEET 11	FILE P.028.00.01

47

SPECIES LISTS FOR LAKE BRONSON STATE PARK

BIRDS

Red-necked grebe
Eared grebe
Pied-billed grebe
Great blue heron
Least bittern
American bittern
Canada goose
Snow goose
Mallard
Gadwall
Pintail
Blue-winged teal
American widgeon
Northern shoveler
Wood duck
Redhead
King necked duck
Lesser scaup
Ruddy duck
Cooper's hawk
Red-tailed hawk
Marsh hawk
American kestrel
Ruffed grouse
Sharp-tailed grouse
Sand-hill crane
Sora rail
American coot
Killdeer
American woodcock
Common snipe
Spotted sandpiper
Greater yellowlegs
Lesser yellowlegs
Pectoral sandpiper
Least sandpiper
Marbled godwit
Wilson's phalarope
Franklin's gull
Forester's tern
Black tern
Mourning dove
Great horned owl
Short-eared owl
Common nighthawk
Ruby throated hummingbird
Belted kingfisher
Common flicker
Hairy woodpecker
Downy woodpecker
Eastern kingbird
Great crested flycatcher
Eastern phoebe
Least flycatcher
Eastern wood pewee
Horned lark
Tree swallow
Bank swallow
Barn swallow
Cliff swallow
Blue jay
Black-billed magpie
Common crow
Black-capped chickadee
White-breasted nuthatch
House wren
Long-billed marsh wren
Gray catbird
American robin
Sprague's pipit
Cedar waxwing
Starling
Yellow-throated vireo
Red-eyed vireo
Yellow warbler
Common yellowthroat
American redstart
House sparrow
Bobolink
Western meadowlark
Yellow-headed blackbird
Red-winged blackbird
Northern oriole
Brewer's blackbird
Common grackle
Brown-headed cowbird
Common redpoll
American goldfinch
Savannah sparrow
Le Conte's sparrow
Sharp-tailed sparrow
Vesper sparrow
Lark sparrow
Clay-colored sparrow
Song sparrow
Chestnut-collared longspur
Snow bunting

MAMMALS

Cinereous shrew
Pigmy shrew
Short-tailed shrew
Little brown bat
Silver-haired bat
White-tailed jack rabbit
Snowshoe hare
Cottontail rabbit
Woodchuck
Richardson's ground squirrel
Striped ground squirrel
Franklin's ground squirrel
Eastern chipmunk
Gray squirrel
Northern pocket gopher
Mississippi valley pocket gopher
Beaver
Prairie deer mouse
Red-backed vole
Common meadow mouse
Muskrat
House mouse
Meadow jumping mouse
Racoon
Short-tailed weasel
Mink
Striped skunk
Badger
Red fox
Coyote
White-tailed deer
Moose

FISHES

Northern pike
Walleye
Yellow perch
Common sucker
Northern redhorse
Black bullhead
Rock bass
Freshwater drum
Carp
Tadpole madtom
Johnny darter
Blackside darter
Central mudminnow
Blacknose dace
Northern redbelly dace
Hornyhead chub
Bluntnose minnow
Fathead minnow
Big mouth shiner
Common shiner

REPTILES AND AMPHIBIANS

Snapping turtle
Western painted turtle
Northern prairie skink
Red-sided garter snake
Western plains garter snake
Northern red-bellied snake
Smooth green snake
Mudpuppy
Eastern tiger salamander
American toad
Canadian toad
Spring peeper
Gray treefrog
Chorus frog
Northern leopard frog
Wood frog

AGREEMENT
between
MINNESOTA DEPARTMENT OF NATURAL RESOURCES
and
MINNESOTA HISTORICAL SOCIETY

This Agreement, entered into this 27th day of December, 1971, by and between the Minnesota Department of Natural Resources, acting through the Commissioner of Natural Resources, pursuant to Minnesota Statutes, Chapters 84 and 85, hereinafter called the Department, the Minnesota Historical Society, acting through its Director, hereinafter referred to as the Society, to coordinate effective efforts to develop, maintain and administer for public benefit historic sites, historic districts and monuments and archaeological sites as they now exist as individual entities or as parts of large state land areas administered by the Department of Natural Resources, hereinafter referred to as state land, do hereby define areas of responsibility and authority on state land.

1. The Society or State Archaeologist agrees to provide research and analysis to determine the sites of historic and/or archaeological significance to be set aside, identified and marked with suitable inscriptions for preservation and interpretation on state land. These sites shall be delineated on any inventory and classification of sites prepared by the Society. This process will directly relate to the funding and staff time available for this purpose determined by the Minnesota Historical Society.

2. The Department desires to prepare master plans for the development of facilities, essential to public access and use for recreational purposes as well as updated resource management plans on such land under its jurisdiction so as to avoid and minimize depredation or damage to the historic and/or archaeological areas on such land. Such plans shall be furnished to the Society for their information and guidance. Agreement between the Department and the Society must be reached on plans relating to historical areas before development can proceed. Unless objections are received within 30 days, agreement will be assumed. The Department shall present copies of all developmental plans affecting sites delineated as historical or archaeological on any inventory and classification of such areas to the Society prior to advertising for bid on any construction so that the Society may make studies and investigations of the archaeological and historical values.

3. When archaeological or historic sites are known or, based on investigations, are suspected to exist on state land or waters the Society upon request from the Department shall obtain for the Department a licensed, qualified professional archaeologist to help preserve these sites.

4. The Department shall notify the Society at least forty days prior to the offering for sale or lease state lands under its jurisdiction, timber, minerals, or gravel or the altering of any body of water within designated historic and/or archaeological sites or areas.

5. The Department of Natural Resources will enforce the provisions of the Minnesota Field Archaeology Act of 1963, Minnesota Statutes 138.31 to 138.42, and to subsequent Amendments to these statutes on state land under its jurisdiction.

6. The Society and the Department may prepare and install interpretive exhibits (in existing buildings or proposed buildings) which, in its judgement, on lands or waters administered by the Departments of Natural Resources which the Society and Department jointly determine are suitable for such purposes, and costs of such features shall be met by any funds appropriated for such purposes to either the Department or the Society.

7. The Society shall identify original sites or buildings of historical or archaeological significance deserving preservation, restoration or reconstruction on state land administered by the Department of Natural Resources. The Society and the Department jointly shall determine which buildings or sites are suitable for such historical purposes, and decide on alterations in them to render them more suitable for interpretative and public service purposes. Costs of development shall be met by any funds appropriated for such purposes to either the Department or the Society.

8. The Department shall administer, develop, maintain, and operate all buildings, facilities and utilities as required for public accommodation and compatible recreation features, and enforce all rules and regulations and operate special fee services in these state parks as authorized by statutes... Except in those historical areas as described in Minnesota Session Laws 1969, Chapter 956.

9. This Agreement imposes no liability upon the State, the Commissioner of Natural Resources, or any other officers, employees or agents of the State for the acts or ommissions of any officer, employee or agent of the Society.

10. This Agreement is in force until amended or repealed by mutual agreement between the Department and the Society.

11. This Agreement shall supercede Agreement number 2 entered into by the State and the Society on the 14th day of August, 1968.

12. To keep this Agreement in force the Department and Society agree to meet at least semi-annually to review the operation of this Agreement and to correct problems that may have arisen because of it.

13. This Agreement shall be subject to the Minnesota Historic Sites Act of 1965 and to subsequent amendments to that statute.

14. Nothing in this Agreement shall be contrary to existing Minnesota Statutes nor to Rules and Regulations as adopted by each agency.

15. This Agreement shall be in effect until rescinded or superceded by joint agreement of the two agencies affected.

IN WITNESS WHEREOF, the respective authorities affix their seals and signatures this 27th day of December 19 71 .

Robert L. Herbst
Commissioner
Dept. of Natural Resources

Russell W. Fridley
Director
Historical Society

LAKESIDE SUBDIVISION

TRACT NO. ACRES NAME	ACQUISITION BY STATE OF MINN. DEED RECORDING DATA	REMARKS
S-1 0.5 Township of Percy	Filed: 5-29-36 Bk. 59 Pg. 513	
S-2 280.0 Great Northern Ry.	Doc. No. 21698 Filed: 6-15-36 Bk. 29 Pg. 602	
S-3 447.8 W. E. Bertram	Doc. No. 86762 Filed: 8-8-38 Bk. 63 Pg. 197	
S-4 10.7 Great Northern Ry.	Doc. No. 87128 Filed: 12-8-38 Bk. 63 Pg. 277	
S-5 17.3 Augustinus Lindstrom	Doc. No. 90905 Filed: 12-29-42 Bk. 67 Pg. 46	
S-6 147.86 Kittson County	Doc. No. 113898 Filed: 12-15-61 Bk. 28 Pg. 217-18	
1 20.0 Kittson County		
2 21.5 Baptist Bible Camp		
3 20.0 Lake Bronson Village	Doc. No. 127700 Filed: 12-5-73 Bk. 127 Pg. 577-8	
4 18.5 Nels Nelson	Doc. No. 125984 Filed: 9-18-72 Bk.124 Pg.675-6	GRANTOR RESERVES RIGHT TO LEASE THRU 12-31-72
5 30.0 Levine D. Vagle	Doc. No. 124111 Filed: 5-12-71 Bk. 122 Pg. 261-2	
6 22.0 Galilee Bible Camp	OPT 10-11-72	
6A 9.0 Galilee Bible Camp		
7 38.3 Bouvette & Furaas	Doc. No. 124718 Filed: 11-3-71 Bk. 123 Pg. 187-8	
8A 160.0 Marvin G. Johnson		
8B 80.0 Marvin G. Johnson		
8C 80.0 Marvin G. Johnson		
9A 160.0 Midwest Potato Inc.		
9B 320.0 Midwest Potato Inc.		
10 40.0 Lake Bronson Rifle Club	OPT 10-5-72	
11 40.0 North Lights of Hallock	OPT 10-5-72	
12 160.0 J.D. Collins	Doc. No. 124969 Filed: 12-30-71 Bk. 123 Pg. 543-4	
14 160.0 Wallace Gunderson	Doc. No. 128187 Filed 4-10-74 Bk. 128 Pg. 405-6	
15 380.0 Wesley J. Hazelton		
18 200.0 Kittson County	Doc. No. 125449 Filed 6-7-72 Bk. 42 Pg. 133-4	
20 40.0 Northern Foods Inc.		
21 39.02 Ore Ida Foods Inc.		
23 10.0 Kittson Co. Saddle Club	Doc. No. 124422 Filed: 8-5-71 Bk. 122 Pg. 601-2	Grantor Retains Possession Until 8-5-74

TRACT NO. ACRES NAME	ACQUISITION BY STATE OF MINN. DEED RECORDING DATA	LOCATION BLOCK LOT	REMARKS
13 0.09 G. W. McAllen		2 2	
16 0.18 Josie Younggren		2 3,4	
17 0.09 Marion E. Vagle		2 5	
18A 9.93 Kittson County	Doc. No. 125449 Filed: 6-7-72 Bk. 42 Pg. 133-4	3 1-5,7-15 4 4,5,7-9,13-15 5 1-4,6,7,12-15 6 1-5,9-13,15 7 1-9,12 8 1-6,8-12 9 1-5,7-9 10 3-7,9 11 2-6 12 1,2,4 13 1-3 14 2,3	
22 0.18 Alton E. Nelson	Doc. No. 124173 Filed: 6-7-71 Bk. 122 Pg. 327-8	1 3,4	
24 0.18 Ted Kimbrough		1 6,7	
25 0.18 Orval A. Dagen, Jr.		1 8,9	
26 0.09 Sandahl & Peterson		1 10	
27 0.18 ElRoy R. Fertig		1 11,12	
28 0.29 Rowena Rasmussen		1 13,14,20	
29 0.09 Vincent Mattson		1 15	
30 0.15 Roy Ryden		1 16	
31 0.23 Ray Swanson		1 17,21	
32 0.11 Arnold Getschel		1 18	
33 0.11 Orville G. Gast		1 19	
34 0.12 Irene Stratte		1 22	
35 0.09 Helmer Erickson		2 1	
36 0.09 Donald R. Lund		2 6	
37 0.18 Ray W. Dunn		1 1,5	
38 0.09 Leo C. Locken		1 2	
39 0.09 Gunnar Wass		2 7	
40 0.09 Paul O. Hanson		2 8	
41 0.18 David Ryden		2 9,10	
42 0.09 Hilma Hemmington		2 11	

TRACT NO. ACRES NAME	ACQUISITION BY STATE OF MINN. DEED RECORDING DATA	LOCATION BLOCK LOT	REMARKS
43 0.09 W. D. Treleaven		2 12	
44 0.09 Luverne E. Klegstad		2 13	
45 0.09 Scott Omundson		2 14	
46 0.47 James F. Ulmer		2 15,16,18,22	
47 0.11 Ulmer & Farbard		2 17	
48 0.78 Cekiel Danielson		2 19 4 11 5 11 6 7 7 11 10 2 14 1	
49 0.11 Carl O. Furaas		2 20	
50 0.11 Helmer Mahagen		2 21	
51 0.78 Alvin Aslakson		3 6 5 8,9 9 6 10 8 12 5,6	
52 0.09 Bernhard Nelson		4 1	
53 0.18 Budd C. Wennersten		4 2,3	
54 0.09 Violet Gast Schultz		4 6	
55 0.66 Jonas Gudmundson		4 10 5 5,10 7 10 8 7 12 3	
56 0.09 Robert A. Olson		4 12	
57 0.46 Delbert I. Dunklee		6 6,14 10 1 11 1	
58 0.11 A. S. Berlin		6 8	
59 12.43 Dedicated Streets			

STATUTORY BOUNDARY 2983.3 ACRES

No.	Date	Revision	By	Chkd.	Appr.

Reference Drawings

MINNESOTA DEPARTMENT OF NATURAL RESOURCES
BUREAU OF ENGINEERING
DIVISION OF PARKS AND RECREATION
OWNERSHIP MAP

Survey | Designed | Checked 10-27-70 R E SMITH
Datum | Drawn 8-7-70 L.D. SWENSON | Ownership Revision RES 11-10-72

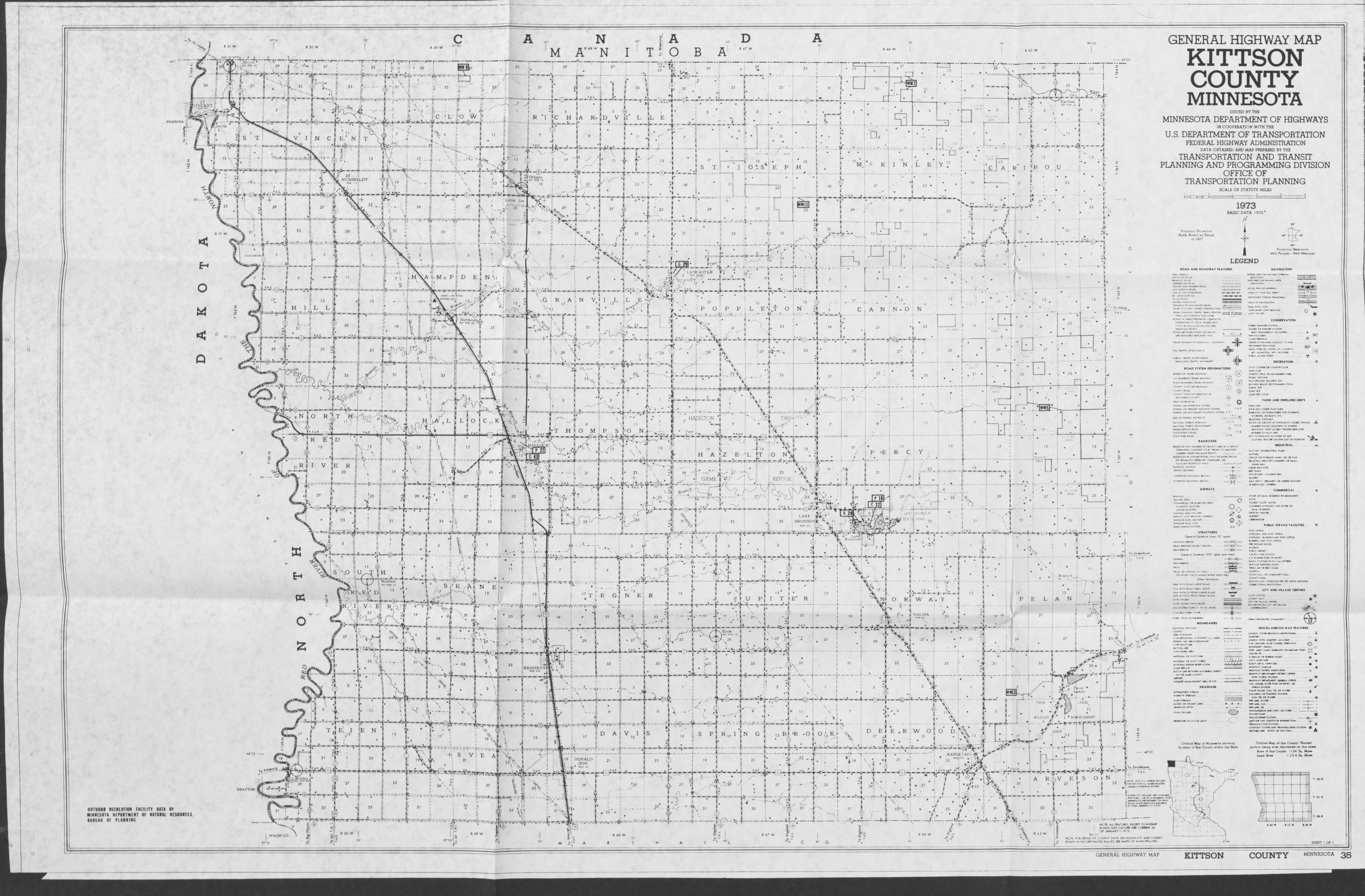
Date 10-27-70 Acting Administrator

LAKE BRONSON STATE PARK

KITTSON COUNTY - NEAR LAKE BRONSON

Sec. | T. 160 & 161 N. | R. 46 W.

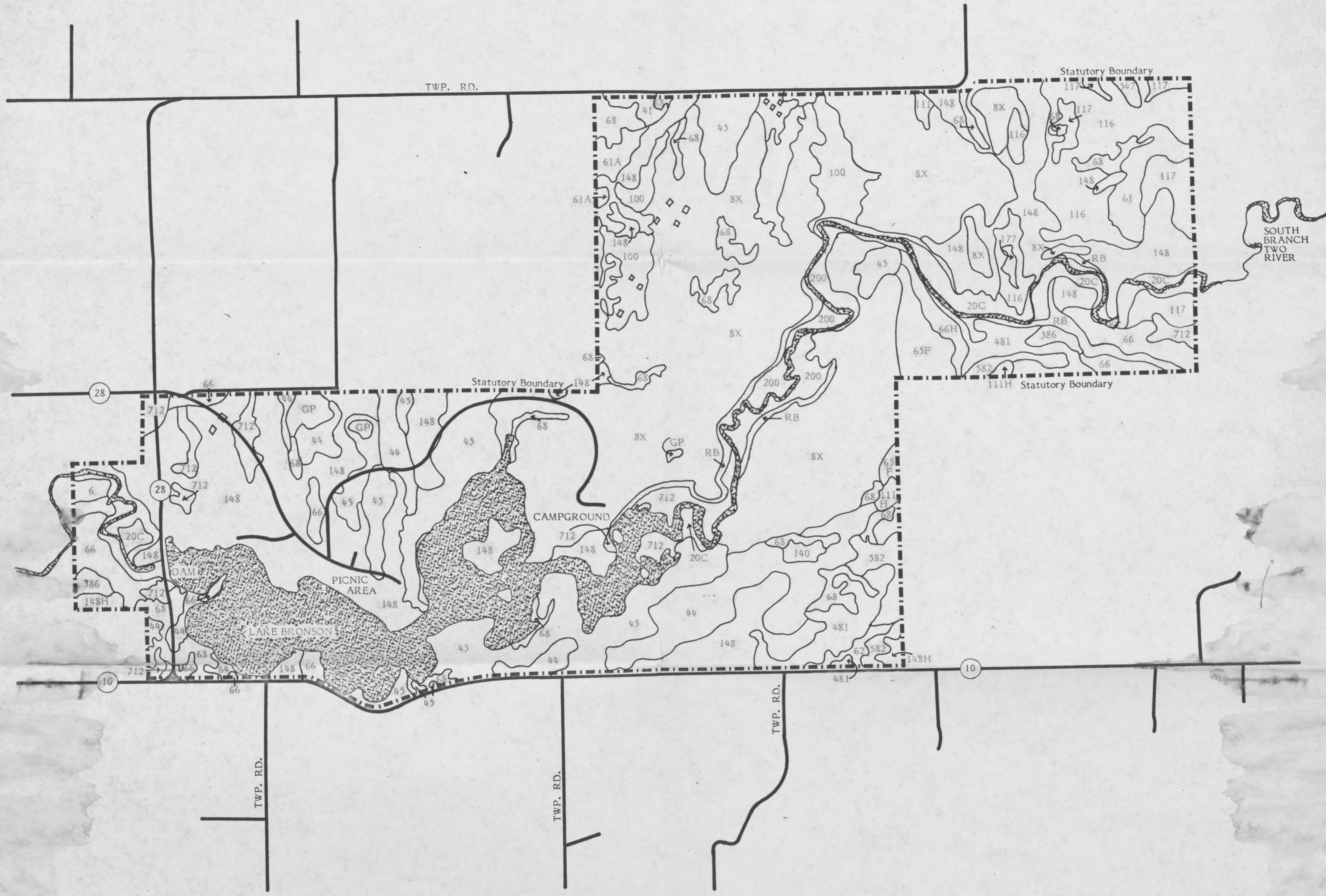
Dept. Code REG. 502 | Reg. 70-4 | Sheet 14 | File P.028.00.01

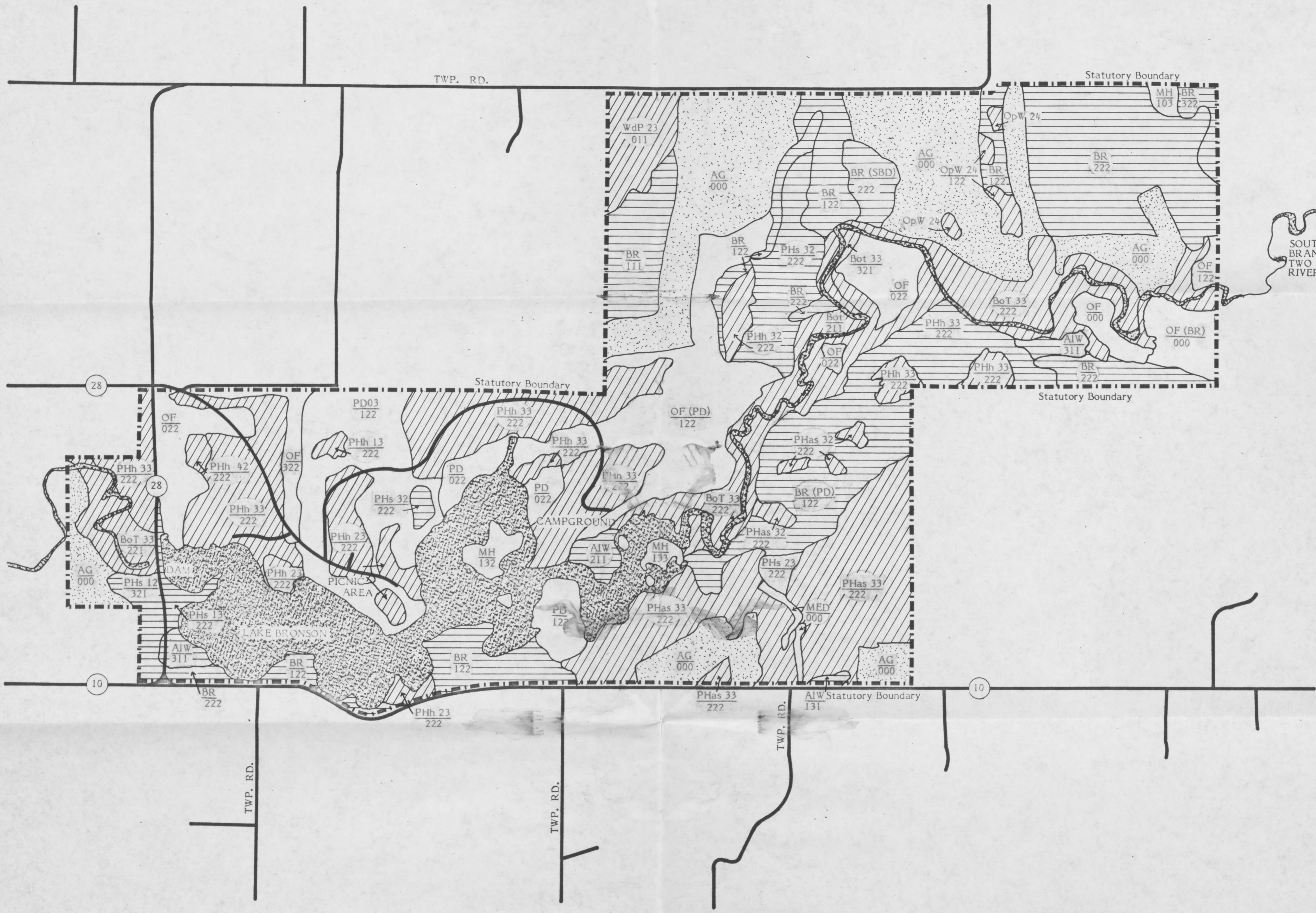


KITTSON COUNTY CO.NO. 35 MAP SHEET 1 MINNESOTA OUTDOOR RECREATION AREA INVENTORY

MAP SYMBOL	NAME OF RECREATION AREA	FEE	OWNR	ADMN	LOCATION TWP RNG S	MAC. EFS. MCD. SCH.	BOUNDARY ACRES	NO. RESORT UNITS	CAMPGROUND SITES PRIM MOD	GRP. CAMP BEDS	WILDLIFE AREA MANAGED ACRES	GOLF	MARINA CBB	ATH FLD AC	PG	PUB. ACC. PK. SP.	RAMP	PICNIC TABLES	BPCOHOL	TRAILS NAT	TRAILS HOR	TRAILS SNO	TRAILS HIK	TRAILS BIK	HORS	SKI	FISH	V.FM	G.ANG	R.AMY	F.AIR	R.ACE	DATE INFO M/YR
5WM	BEACHES WMA W 785	1	S	30	16245W00	30785	40126.0				7734																						0771
7WM	CARIBOU WMA W 786	1	S	30	16346W00	30786	19214.4				4353																						0771
9WM	JOE RIVER WMA W 710	1	S	30	16450W34	30710	80.0				80																						0771
11WM	SKULL WMA W 437	1	S	30	16347W14	30437	6480.0				6480																						0771
13WM	TWIN LAKES WMA W 276	1	S	30	15945W10	30276	8099.8				7600																						0771
18 P	LAKE BRONSON STATE PARK	2	S	40	16146W33	50208	2983.0						X					151	X		4	6	6										0472
20 A	LK.BRONSON (SP) ACCESS	2	S	40	16146W32	00000	.0									67C																	0472
22 C	LK.BRONSON SP CAMPGRND.	2	S	40	16146W32	00000	.0		81																								0472
27 P	HALLOCK MUNICIPAL PARK	1	M	80	16149W12	00000	4.0		20			9		1	X			12	X	X		10	5										0572
29 G	LANCASTER MUN. GOLF CLUB	2	M	80	16247W07	00000	160.0					9																					0372
34AF	HUMBOLDT PUB.SCH.ATH.FLD	1	Z	88	16350W23	S0354	.0							4	X																		0572
36AF	LANCASTER PUB.SCH.ATH.F.	1	Z	88	16248W14	S0356	.0							10	X																		0572
38AF	KARLSTAD SCH. ATH. FIELD	1	Z	88	15946W24	S0353	.0							5	X																		0572
43 G	OAK RIDGE COUNTRY CLUB	2	P	92	16148W18	00000	60.0					9		12	X	12		20	X														0472

14 RECREATION AREAS THIS MAP SHEET


TWP. RD.
Statutory Boundary
SOUTH BRANCH TWO RIVER
Statutory Boundary
Statutory Boundary
28
CAMPGROUND
PICNIC AREA
DAM
LAKE BRONSON
10
TWP. RD.
TWP. RD.
TWP. RD.


TWP. RD.
Statutory Boundary
SOUTH BRANCH TWO RIVER
LAKE BRONSON
DAM
PICNIC AREA
CAMPGROUND
TWP. RD.
TWP. RD.
TWP. RD.
28
10
WdP 23 011
AG 000
BR (SBD) 222
BR 122
OpW 24
OpW 24 122
BR 222
MH 103
BR 322
BR 111
PHs 32 222
Bot 33 321
OF 022
BoT 33 222
OF 000
AIW 311
OF (BR) 000
OF 122
PHh 32 222
PHh 33 222
OF (PD) 122
PD03 122
PHh 13 222
PHh 42 222
OF 322
PHs 32 222
PD 022
MH 132
MH 133
AIW 211
PHas 32 222
BR (PD) 122
PHs 23 222
PHas 33 222
MED 000
PHs 12 321
PHs 13 222
AIW 311
BR 222
PHh 23 222
AIW 131

T.161 N., R. 46 W. – Percy Twp.
Tax Info.
Private Lands in L. Bronson State Park

Tract No.	Owner	Legal Description	Acreage	Total Tax Paid	Residence
1	Kittson Co.	W½, NW¼, NW¼, S. 33	20.0	Exempt No Tax	
2	Baptist Bible Camp	W½, SW¼, NW¼, S. 33	21.5	Exempt	
6A	Galilee Bible Camp	In S½, NW¼, NE¼, S.33	9.0	Exempt	
8A	Marvin G. Johnson	W½, NW¼, S. 27 W½ SW¼, S. 27	160.0	$45.80	Perm. Residence
8B	" "	N½, NE¼, S. 27	80.0	$38.02	
8C	" "	N½, NE¼, S. 26	80.0	$41.96	
owner 9A	Joseph Rubash ~~Midwest Potato Inc.~~	E½, NW¼, S. 27	160.0	$118.34	
9B	Joseph Rubash ~~Lute B.~~	NW¼, S. 26 N½ SW¼, S. 26	320.0	$216.24	
~~10~~		S½ NE¼, S. 26			
~~10~~	~~Lake Bronson Rifle Club~~	~~SW¼, NE¼, S. 27~~	~~40.0~~	Acquired	9.68 Paid in 1975
~~11~~	~~North Lights of Hallock~~	~~SE¼, NE¼, S. 27~~	~~40.0~~	Acquired	9.68 Paid in 1975
15	Wezley J. Hagelton	SE¼, S. 34 120 Ac. in NE¼, S. 34 100 Ac. in SW¼, S. 34	380.0	$83.36 – Perm. Resid.	
2ϕ	Grant Bothom ~~N. Food Inc.~~	NE¼, SW¼, S. 32	39.02 ~~40.0~~		
20	~~Grant Bothom~~ ~~Ore Ida Foods Inc.~~	SE¼, NW¼, S. 32	40.0 ~~39.02~~		

Lakeside Subdivision (In SE¼, NW¼, S. 33) 19.73 acres

Tract No.	Owner	Block	Lot	Acreage	Total Tax Paid	Residence
13	G.W. McAllen	Block 2	Lot 2	.09	$30.48	
16	Josie Youngren	2	3, 4	.18	3-$1.36 4-$38.88	
17	Marion E. Vagle	2	5	.09	$25.68	
24	Ted Kimbrough	1	6, 7	.18	$30.92	
25	Orval A. Dagen Jr.	1	8, 9	.18	$22.08	
26	Sandahl & Peterson	1	10	.09	$33.64	
27	ElRoy R. Fertig	1	11, 12	.18	$2.72	
28	Rowena Ramussen	1	13, 14, 20 Sold	.29	$27.28	
29	Vincent Mattson	1	15	.09	$24.38	
30	Roy Ryden	1	16	.15	$1.36	
31	Ray Swanson	1	17, 21	.23	$2.72	
32	Arnold Getschel	1	18	.11	$1.36	
33	Orville G. Gast	1	19	.11	$1.36	
34	Irene Strotte	1	22	.12	$1.36	
35	Helmer Erickson	2	1	.09	$23.66	
36	Levin D. Vagle ~~Donald R. Lund~~	2	6	.09	$32.48	

37	Roy W. Dunn	1	1,5	.18	$2.72	
38	Leo C. Locken	1	2	.09	$30.70	✓
39	Gunnar Wass	2	7	.09	$42.24	✓
40	Paul O. Hanson	2	8	.09	$1.36	
41	David Ryden	2	9,10	.18	$32.48	✓
42	Anita Frost & David Ryden ~~Hilma Hemmington~~	2	11	.09	$27.76	✓
43	Rudolph Grosser ~~W.D. Treleaven~~	2	12	.09	$32.64	✓
44	Luverne E. Klegstad	2	13	.09	$15.78	✓
45	Fredric Wilebski ~~Scott Omundson~~	2	14	.09	$12.62	✓
46	James F. Ulmer	2	15, 16, 18, 22	.47	$26.38	✓ 150.16
47	Ulmer & Farbard	2	17	.11	$1.36	
48	Cekiel Danielson	2	19	.78	$10.88	
		4	11			
		5	11			
		6	7			
		7	11			
		10	2			
		14	1			
49	Carl O. Furaas	2	20	.11	$1.36	
50	James H. Ulmer ~~Helmer Mahagen~~	2	21	.11	$1.36	
51	Alvin Aslakson	3	6	.78	$6.80	
		5	8,9			
		9	6			
		10	8			
		12	5, 6			
52	Bernhard Nelson	4	1	.09	$19.36	✓
53	Budd C. Wennersten	4	2, 3	.18	$24.60	✓
54	Violet Gast Schultz	4	6	.09	$1.36	
55	Ingolf Voge ~~Jonas Gudmundson~~	4	10	.66	$8.16	
		5	5, 10			
		7	10			
		8	7			
		12	3			
56	Robert A. Olson	4	12	.09	$13.98	✓
57	Delbert I. Dunklee	6	6, 14	.46	$5.44	
		10	1			
		11	1			
58	A.S. Berlin	6	8	.11	$1.36	
59	Dedicated Streets	Lakeside Subdivision		12.43		

OVER

Total Property Tax Paid to Co. for 1975 = $ 11,177.12 less homestead credit = 10,466.34

Percy Twp

Redistributed to

~~Percy~~ Twp	Mill Rate	Amount of Total ~~Reimbursed~~ To	% Mill Rate
			~~56~~
School District 35~~t~~3	40.38 - Ag. ~~48.71 - Non Ag~~	6255.70	56
County	21.50	3275.70	30
Percy Twp.	9.84	1499.22	14
Total Mill Rate	71.72 - Agric. ~~80.05 - Non Agric.~~	10,466.32	100

Total County

Levied = 2,618,022.46 - less homestead credit = 2,444,081.74

Reimbursed = County = 674,496.86

Total levied for S.D. 353 = 251,472.92

S.D 353 include part of Roseau + Marshall Counties
for S.D. 353 in Kittson Co. = 223,464.84 levied

~~Tr~~ Tract 21 - NE¼, SW¼ S. 32 39.02 Acres
L.A. Waller, Lake Bronson
That part of NE¼, SW¼, S. 32 N. of Two River
7.00 Acres Tax = $31.20
Remaining 32.02 Acres Northern Foods Inc. C/o
Ore-Ida Foods Inc. P.O. Box 10 Boise, Idaho
Tax = $38.68

Tract 20 - SE¼, NW¼, S. 32 - 40.0 Acres
Ore-Ida Food Inc.
40.0 Ac. Tax = $12.03

4 Farm operations - 2 farm residences
All Lands Taxed as Agricultural

Lakeside Subdivision - No Homestead Credits on Tracts so
No permanent residence
No. of seasonal homes = 20-?

Lakeside Sub-division

28	Rowena Rasmussen	1 - 13, 14 ✓
	Lawrence LaBine	1 - 20
	~~Ingolf Voge~~	~~4-10~~

S.D. 353 & Percy Twp. - Taxes levied all for agricultural
Land

Lake Bronson State Park - Tax Breakdown

Tract No.	Percy Twp.	S.D. 353	County	Total Tax
8A	6.28	25.79	13.73	45.80
8B	5.32	21.29	11.41	38.02
8C	5.87	23.50	12.59	41.96
9A	16.57	66.27	35.50	118.34
9B	30.27	121.09	64.87	216.24
15	11.67	46.68	25.01	83.36
20	1.68	6.74	3.61	12.03
21	5.42	21.66	11.60	38.68
13	4.27	17.07	9.14	30.48
16	5.63	22.53	12.07	40.24
17	3.60	14.38	7.70	25.68
24	4.24	17.32	9.28	30.92
25	3.09	12.36	6.62	22.08
26	4.71	18.84	10.09	33.64
27	.38	1.52	.82	2.72
28	3.82	15.28	8.18	27.28
29	3.41	13.65	7.31	24.38
30	.19	.76	.41	1.36
31	.38	1.52	.82	2.72
32	.19	.76	.41	1.36
33	.19	.76	.41	1.36
34	.19	.76	.41	1.36
35	3.31	13.25	7.10	23.66
36	4.55	18.19	9.74	32.48
37	.38	1.52	.82	2.72
38	4.30	17.19	9.21	30.70
39	5.91	23.65	12.67	42.24
40	.19	.76	.41	1.36
41	4.55	18.19	9.74	32.48
42	3.89	15.55	8.33	27.76
43	4.57	18.28	9.79	32.64
44	2.21	8.84	4.73	15.78
45	1.77	7.07	3.79	12.62

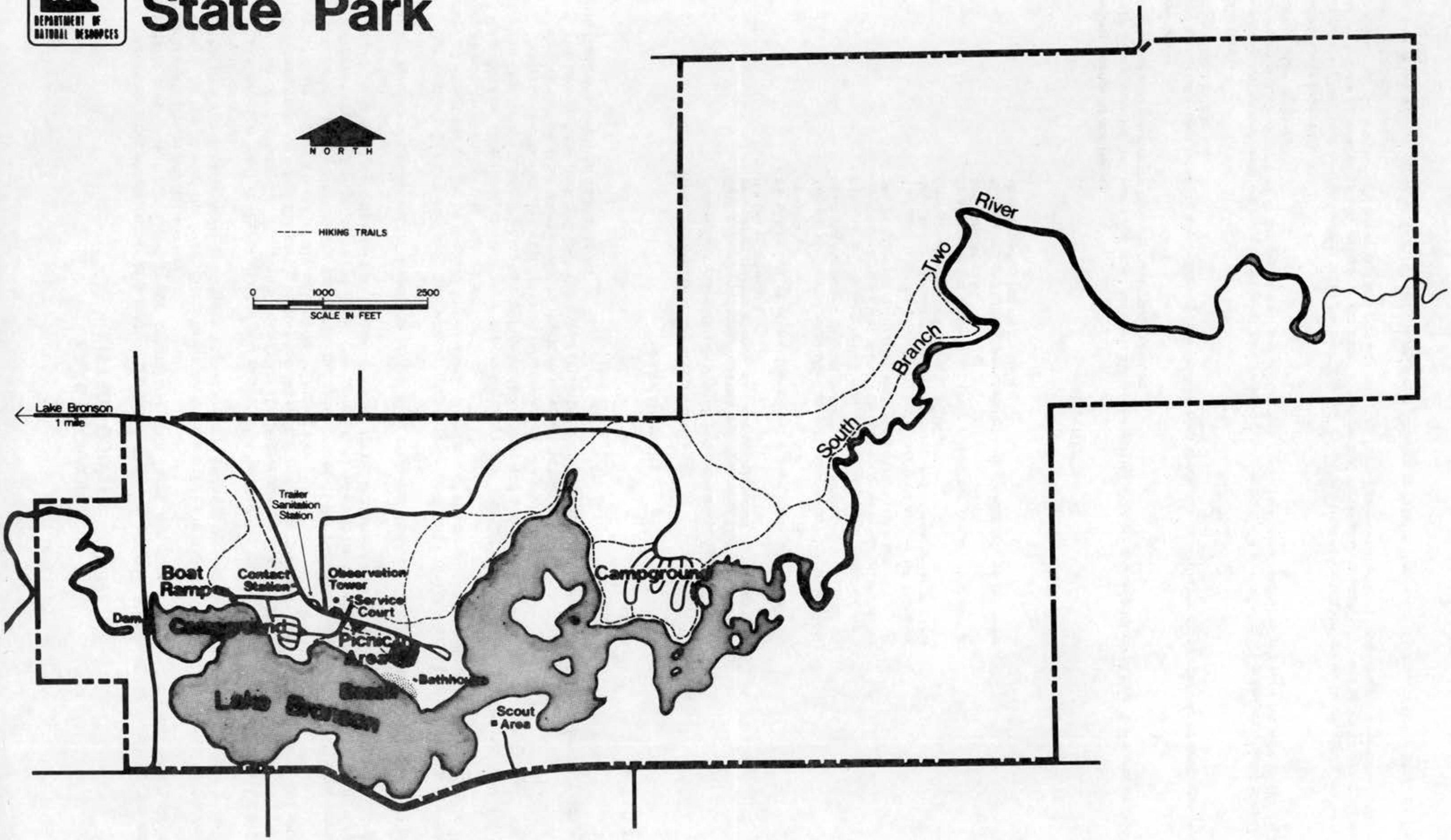
Tract No.	Percy Twp.	S.D. 353	County	Total Tax
46	3.69	14.77	7.91	26.38
47	.19	.76	.41	1.36
48	1.52	6.10	3.26	10.88
49	.19	.76	.41	1.36
50	.19	.76	.41	1.36
51	.95	3.81	2.04	6.80
52	2.75	10.84	5.81	19.36
53	3.44	13.78	7.38	24.60
54	.19	.76	.41	1.36
55	1.14	4.57	2.45	8.16
56	1.96	7.83	4.19	13.98
57	.76	3.05	1.63	5.44
58	.19	.76	.41	1.36
Totals	170.16	681.57	365.03	1216.76
% of Total	14	56	30	100

Amounts Levied for 1975

	1,499.22	251,472.92	674,496.86	2,444,081.74 ~~2,618,022.46~~
% Tax Loss	11.35	0.27	0.05	~~0.05~~

Minnesota
DEPARTMENT OF NATURAL RESOURCES

Lake Bronson State Park



LAKE BRONSON
KITTSON COUNTY

Minnesota's northwest corner is a land of transition. This area provides a taste of the forests to the east. Hardwoods break the horizon and divide potato and grain fields. But here too begin the plains which stretch endlessly west. The land is flat and dry.

Here, on the edge of the Great Plains where lakes are scarce, Lake Bronson State Park is a welcome change of pace. This park and the lake which it includes provide the only facilities for water sports and other outdoor activities for many miles around.

Lake Bronson itself is the geographic and recreational heart of the park which is located in central Kittson County just off highway 59. The park's boundaries completely enclose the more than 300 acres of this long and winding man-made lake and the park's visitors are always on, in or near the water. The woods of birch and aspen along the shore harbors a great variety of wildlife, including moose.

In the late 1930's the idea of a dam across the south branch of the Two Rivers was discussed. The idea seemed like the answer to a lot of problems: Hallock, the county seat, suffered from a chronic water shortage. The whole area was in the grips of the depression and needed the jobs the project would provide and besides, there was no place to swim or fish nearby.

But quicksand threatened to thwart the project. The proposed dam-site was reportedly underlain by 100 feet of it.

But engineer Clifford Holland, the designer of the New York auto tunnel which bears his name devised a system by which the weight of the dam forced water up and out of the quicksand through pipes thus solidifying the structure enough to support its own weight.

As the new lake filled, expert stone masons employed by the WPA built a picnic shelter and combination water and observation tower. Parking lots and picnic tables followed and a state park was born.

Today, Lake Bronson performs the same functions it did 30 years ago.

Hallock still relies on the reservior to maintain its water supply.

The lake and the park still give the area a recreational and an economic boost, having visits from Canada and North Dakota in addition to Minnesota.

PARK MANNERS

Read and heed all posted rules and park signs.

Help protect your park. Preservation is everyone's business.

Take pictures and memories; leave only footprints. Don't dig trenches, pick plants, molest animals, or scavenge dead wood – it's needed for the soil environment.

Be considerate of others. Maintaining a clean, quiet park is best for everybody.

The use of firearms, explosives, air guns, slingshots, traps, seines, nets, bows and arrows and all other weapons is prohibited.

Pets are prohibited from all park areas except when restrained on a leash measuring six feet or less. Pets may not enter buildings. Horses are permitted only on trails specifically designated for such use.

The park is closed from 10:00 p.m. until 8:00 a.m. of the following day, except in campgrounds or in cabin areas. Loud noises or other disturbances are prohibited after 10:00 p.m.

Park permits are required for every vehicle and can be purchased at park headquarters.

Motor bikes and other licensed vehicles are allowed only on the motor vehicle roads – not on the trails.

FACILITIES

Camping, Picnicking and Hiking

Campsites are provided with water and toilet facilities. Tables and parking areas are available for picnicking. Trails provide diverse opportunities to experience the park and participate in nature.

Water Sports

Where appropriate, boat launching and swimming facilities have been developed. Activities should be confined to designated areas. Fishing subject to state law.

Winter Sports

Ski touring and snowshoeing are encouraged in all state parks and are not confined to marked trails unless specifically restricted. Snowmobiling is permitted only in designated areas and posted trails under conditions considered adequate for park protection by the park ranger or manager.

Environmental Education

Schools and conservation-oriented groups aren't the only ones that can benefit from outdoor learning experiences. Make the most of your recreational experience here by using it to get closer to natural laws that bind us to one another and to the living environment that sustains us. Your state parks are unique and precious resources for building values and life styles necessary for the survival of a healthy biotic community.

This park is managed by the Minn. Dept. of Natural Resources, Division of Parks & Recreation, Centennial Office Bldg., St. Paul, Minn. 55155.

of the same tree, was a robin nest; while hanging from still another branch was a nestbox occupied by a pair of wrens. When one of our pet cats stretched out on the porch steps for a siesta the robins viewed the situation with alarm, the wrens poured out a stream of invective that sounded like avian boogie woogie, but the doves, true to their nature also, were prefectly silent.

The traits most characteristic of a dove—gentleness, mildness, timidity—are so well known that we have an adjective which combines and describes them perfectly—"dove-like". The color predominating in the plumage of most species of doves gives us yet another word—"dove gray".

In the case of the mourning dove this hue is liberally tinged with brownish—a brownish-gray on the back, and shading to a brownish-yellow beneath. The sides of the neck are iridescent, there is a black spot below the eye, more black spots on the wings, and the tail feathers have a black bar tipped with white. About a foot long, the mourning doves are slender in build, and rather pretty birds though dressed in subdued tints.

Until a little over half a century ago the mourning dove had a big brother or perhaps cousin, the famous passenger pigeon. It was much the same color, but larger and heavier, some four or five inches longer. During the nineteenth century and earlier immense flocks of these "wild pigeons", as they were often called, gathered in areas where food was abundant. Unlike the mourning dove, which nests in single pairs, the passanger pigeon often nested in colonies of thousands of birds in favorable locations. Today, however, they are extinct.

During the time this pigeon was abundant it was also found in Minnesota. Some years ago, when visiting the Roseau County Natural History Museum in Roseau, the late P. O. Fryklund showed me a passenger pigeon's egg he had collected when a boy on his father's homestead near Dassel, Minnesota. Except for its larger size it was identical in appearance to that of the morning dove.

The melancholy coo-ing of the doves accounts for the descriptive part of their name—mourning. In spite of the admittedly sad tone, it is not an unpleasant sound, and it fits the bird—soft, gently modulated, thoroughly "dove-like". More cheerful perhaps, but also characteristic, is the whistling made by the wings when the birds start up in flight.

"From the woods came the voices of the well-contented doves." So thought Tennyson, famous English poet, when he listened to the coo-ing of the doves from the woodland. The note of the dove may be a pensive one, yet there is nothing of complaint in it, or to indicate irritation. Rather something of contentment, bespeaking a temperament which, though certainly not aggressive or demanding, still finds in life that which is satisfying and worth while.

The geology of three State Parks in the Red River Valley —

Lake Bronson, Old Mill, Old Crossing

J. MERLE HARRIS

The parks named above are all located near each other in the northwest corner of the State in the Red River Valley. They have much in common geologically.

Lake Bronson State Park, the most northwesterly of all, is about 84 miles north of Crookston and one and one half miles southeast of the town of Lake Bronson in Kittson County. It consists of about 746 acres along the South Fork of Two Rivers and was formerly called Two Rivers State Park. The lake, about 327 acres in size, is artificial, having been formed by impounding the waters of the river by a dam 40 feet high built at the highway bridge. The lake, which is about 3 miles in length, is a very nice addition to the recreational facilities of the area where very few natural lakes occur.

Old Mill State Park (formerly called Middle River State Park) is located about 57 miles north of Crookston and 17 miles northeast of Warren in Marshall County. It contains about 285 acres of typical prairie terrain divided diagonally by Middle River. As the present name suggests, an old flour mill, with millstones imported from France in 1888, originally operated by water power, is preserved within the Park. About a mile and a half east of the Park is a north-south portion of the Pembina Trail, an old fur and supply trail that connected St. Paul and the old settlement at Pembina, North Dakota.

Old Crossing Treaty State Historic Wayside is located 10 miles northeast of Crookston near the village of Huot in Red Lake County. It consists of about 111 acres of wooded land along the north bank of the Red Lake River. The "old crossing" speaks of the crossing of the Red Lake River by the Pembina Trail, mentioned above. The "treaty" refers to the historic reason for the establishment of the park. It commemorates a peace conference and the signing of a treaty in 1863 between white men and Indians (Pembina and Red Lake—bands of the Chippewa), which ceded to the United States some 3 million acres and led to the settlement of the Red River Valley.

All three parks are in the Red River Valley and geologically lie within the area formerly covered by Glacial Lake Agassiz. This glacial lake, following the last glacier, covered an area in Minnesota, North Dakota and Canada about equal in size to that of all five of the present Great Lakes combined. It has been described in "Geology of Buffalo River State Park", The Conservation Vol-

J. MERLE HARRIS is assistant professor of natural science in the General College, University of Minnesota.

unteer, Jan.-Feb. 1951 and only a portion of the story will be repeated here.

The highest shoreline of Glacial Lake Agassiz in Minnesota trended essentially north-south from the vicinity of Lake Traverse to the vicinity of Maple Lake near Mentor, some 20 miles southeast of Crookston. Here the lake shore turned eastward, passed just south of both of the Red Lakes and finally turned northward again, entering Canada at a point approximately north of Duluth. The old beach is marked by a more or less continuous ridge of gravel which was thrown up by the waves along the shore. The larger pebbles and boulders are very much rounded, giving evidence of the same pommelling and abrasive action to be seen along large lake shores today.

Glacial Lake Agassiz receded by stages, each marked by one or more gravelly ridges similar to that just described. There were apparently five major stages of recession of the lake as evidenced by the grouping of the ridges. The uppermost one is called the Herman Beach since is passes just west of the village of Herman, near Lake Traverse, in southwestern Grant County. For similar reasons each of the other four beaches, beginning with the highest, is named: Norcross, Tintah, Campbell and McCauleyville.

Violent wave action along and near the shore of Glacial Lake Agassiz, together with the deposition of sand and silt in it, erased the surface irregularities and rendered the Red River Valley essentially devoid of lakes—but highly desirable for agriculture.

The general flatness of the area is slightly interrupted by the old beach lines described above. If the horizontal scale of an east-west profile section across the Valley were reduced, or the vertical scale exaggerated, a terraced effect would be revealed—the outer edge of each terrace marked by a gravel beach. Detailed examination of the profile just above and below a gravel beach shows variation from place to place, of course.

A very common relationship, however, is to find a smooth, gentle rise up to the beach line and a slight depression just above or behind it. This situation becomes easily understandable when we observe lake margins today. We often see sandbars, called off-shore bars, built up of the sand and gravel that the waves toss landward when they strike the shallow bottom. The sand is often piled higher than the land bordering the lake and lagoons are formed. The higher waves may sweep over the barrier but only the finer sediments are carried into the lagoons. Lagoons, formed in this way, were apparently quite common along the margins of Glacial Lake Agassiz as shown by numerous areas of quite clayey soils, and in some cases marshy spots, just above the gravel ridges.

The above description of the profile of the Valley sets the stage for understanding some of the peculiarities of the streams that cross it, of which each of our three parks can claim one. Most of the larger streams south of Crookston have their headwaters among the higher moraines and morainic lakes to the east. Upon

entering the valley their gradients are greatly reduced. They are very sluggish except locally where dropping from one terrace level to the next. As such points the streams have cut notches in the gravel beach ridges where there were at first, undoubtedly, quite pronounced rapids.

Several thousand years have elapsed since the disappearance of Lake Agassiz and most of the larger streams that now cross it floor probably came into being soon thereafter. This is sufficient time for a rapids, working in unconsolidated material, to migrate upstream some distance, or to smooth itself essentially out of existence, as the case may be. But in either case the point of inception of the rapids, at or near the notch in the gravel ridge at the edge of each terrace, is often found to be a suitable place to build a dam to form an artificial lake.

What has been said about the streams in the Red River Valley south of Crookston applies equally well to those north of it except that these streams originate on much lower ground. The Red Lake River, which passes through Crookston, and past Old Crossing Treaty State Historic Wayside, has its origin in Lower Red Lake, 1174 feet above sea level. Most of those to the north have sources at least a hundred feet lower, while those to the south often originate two or three hundred feet higher.

Through odd coincidence all three of the parks treated in this article lie on or very near the McCauleyville Beaches mapped by Todd and later by Leverett and Sardeson. "Beaches" is written here in the plural because, while single to the south, the McCauleyville, as well as some of the other beaches, is branched toward the north.

The lake at Lake Bronson is made possible by the geologic relations described above. A dam was built on the South Fork of Two Rivers at approximately the point where is originally cut through the Lower McCauleyville Beach. The lake thus formed is an integral part of flood control of the upper Red River Valley.

Old Mill Park is also located on the Lower McCauleyville Beach some 25 miles to the south where Middle River crosses it. The gradient of the river here was undoubtedly the attraction that led to the location of the old mill. However, gradient alone is not sufficient to guarantee a supply of power. Especially on as small a stream as Middle River large reservoir capacity is necessary to supply water through the dry periods. The incision by the stream was not sufficient to provide this and water power was abandoned rather early. It was replaced by a steam engine and as recently as 1937 a farm tractor supplied the power. The present dam, about a quarter mile down stream from the original one, together with a reservoir beside the stream, impounds enough water for present uses.

About 35 miles still farther south along the McCauleyville Beach, where the Red Lake River crosses it, is Old Crossing Treaty. Here the beach line is rather obscure. It can be found a few miles to the southeast and again to the west and north but in the immediate vicinity of this park there is a gap of at least 5 miles. If we sketch between known points it appears that the shore line had a short east-west trend here. The present weak evidence of the beach in this section may be due to the fact that such a shore line found more protection from the prevailing direction of wave action and hence did not built so high a ridge. Another possibility is that it may have been subsequently swept away by erosion. The valley of the Red Lake River may have been the course of a broad drainage-way at some time after Glacial Lake Agassiz fell to a still lower level.

To the early settlers and travelers in the Red River Valley the gravel beaches made an important contribution. They furnished a system of natural highways—high enough to be above the marshy. land that so often lay between them. However, they had the limitation of being principally a north-south system. This handicap was somewhat less severe than might at first be supposed, however, since the principal direction of long-distance travel in the Valley was north-south. Moreover, the northwest - southeast traffic made great use of the beach lines by following one of them for a considerable distance and then jogging over to the next ridge at the most strategic point.

The Pembina Trail was just such a trail after reaching the Red River Valley, As mentioned earlier, it is this trail, and the historic events that occurred where it crossed the Red Lake River, that has given Old Crossing Treaty its reason for being. For most of the distance from Old Crossing Treaty to several miles north of Old Mill the trail followed the McCauleyville Beach (the upper McCauleyville by the time is reaches Old Mill) very closely. About 8 or 9 miles north of Old Mill it left the beaches and swung to the northwest toward Pembina, thus passing about 12 miles west of Lake Bronson State Park.

The gravel beach lines took on a new importance with the coming of grading equipment and this continues to the present time. These ridges constitute the principal, and in some areas the only, source of gravel. Just north of Lake Bronson State Park there is a gravel pit in the deposits of the Lower McCauleyville Beach. Such deposits have greatly facilitated the building of highways in the Red River Valley whether the highways themselves followed the ridges or not.

The timber in the three parks is quite similar. Cottonwood, burr oak, poplar, box elder, elm, ash and basswood are characteristic.

All three parks have picnic areas. Old Mill and Lake Bronson also have camping, swimming, fishing, hiking and Lake Bronson has boating.

These parks have all been added to the State's imposing list of recreational facilities relatively recently: Old Crossing Treaty in 1931, Old Mill and Lake Bronson in 1937. The preservation of these places of beauty and relaxation is much appreciated by the people of the area as shown by the heavy use that they receive.

Research can determine the uses for one natural resource —

Peat in Minnesota's Future

MOSES PASSER

In the preceding article we briefly described the nature of peat and its historical background. The following is a short summary of its current status.

Peat as Fuel

We know that peat is used as a fuel on a tremendous scale in Russia, and on a large scale in several other European countries. In the United States we have abundant resources of other fossil fuels, and our labor costs are much higher than in European countries. Can fuel from peat ever become a significant factor in our economy?

The standard unit of measurement for fuels is the BTU (British Thermal Unit), and the average value for coal is about 14,000 BTU/pound. Pound for pound, commercial air-dried peat has a heat value—7,000 BTU—about half that of coal. In addition, peat is much lighter than coal—about 25 pounds/cu. ft. against 45 pounds for coal. This means that about four carloads of peat must be shipped to deliver the same fuel value as one of coal: in other words, higher freight costs.

In Minnesota, it will be very difficult for peat as a fuel to compete with lignite from North Dakota, which does not have to be dried, or with coal from Illinois, which can be delivered by cheap lake transportation. In 1956 we have the additional competition of petroleum from North Dakota and Canada, and natural gas from Texas.

A very recent study is that of Clayton Plummer for the Iron Range Commission in 1949. His conclusions,

The author, Mr. Passer, with a soil testing auger.

MOSES PASSER is Associate Professor Department of Chemistry, Duluth Branch, University of Minnesota.

Lake Survey Report
Lake Bronson
Kittson County

I. Introduction.

Lake Name, Number, and Location:
Lake Bronson, (11-3~~7~~2); T. 161, R. 46, S. 32-33-34. Kittson County.

Dates Examined:
August 21-23, 1950. Mapped October 11, 1950 in cooperation with the Federal Soil Conservation Service.

Problem:
General survey.

Previous Investigations:
Mapping prior to construction of dam in summer, 1940.

II. Lake and Basin Characteristics.

Area and Depth:
Area: 309 acres, area extremely variable.
Maximum depth: 29 feet.

Shoreline Slope and Nature of Shoreline:
The shoreline slope is quite abrupt into the old river channel in the lower portion of the lake. In the upper portion the slope is gradual. The shoreline is 35% rubble, 10% sand, 10% gravel, and 45% bog or marsh.

Inlets and Flows: Outlets and Flows:
South fork of Two Rivers. Flow not measured.

Dam:
A dam is located in the outlet of the lake. The lake is completely artificial in the Two Rivers basin.

Benchmark and Lake Level:
The gauge on the dam was used as the benchmark.
The level on October 11, 1950 was 7.95 feet.

Watershed and Shore Cover:
The watershed consists of sandy till and marsh. The lake is located in the bed of glacial Lake Agassiz. The shore cover is limited to aspen and alder brush.

Physical Characteristics:
Color: light brown
Thermocline limits: none
Secchi disc: 5.5 feet
Temperature range: 60 - 64°F.

Chemical Characteristics:
Oxygen range: 6.7 - 7.3 p.p.m.
Total alkalinity: 240 p.p.m.
pH: 7.8 - 8.1
Chemical fertility: Hard-water lake of good fertility.

III. Biological Characteristics.

Plants Present, Extent of Beds:

The shallow portions of the lake have dense beds of submerged aquatics with fringe of cattails and bulrushes along some shores.

Cattail	Typha latifolia - common
Bulrush	Scirpus acutus - common
Coontail	Ceratophyllum demersum - abundant
Sago pondweed	Potamogeton pectinatus - common
Claspingleaf pondweed	Potamogeton Richardsonii - common
Flatstem pondweed	Potamogeton zosteriformis - common
Elodea	Anacharis canadensis - abundant

Plankton and Bottom Fauna:

No samples taken.

Fishes Present:

Common sucker	Catostomus c. commersonnii
Black bullhead	Ameiurus m. melas
Tadpole madtom	Schilbeodes m. mollis
Northern pike	Esox lucius
Yellow perch	Perca flavescens
Walleye	Stizostedion v. vitreum
Johnny darter	Boleosoma nigrum
Blackside darter	Hadropterus maculatus

A rather short list of species for a river lake.

Ratios of Abundance:

Gillnet: 6 sets Hoopnet: 4 sets

Species	Number	No. per Lift	Statewide Average	Lbs. per Lift	Statewide Average	Number	Lbs. per Lift	State Average
Common sucker	11	1.81	5.1	3.58	4.1	1	.37	.4
Black bullhead	89	14.83	12.7	3.46	4.1	66	1.95	3.9
Northern pike	5	.83	3.6	1.25	6.4	1	.40	.3
Yellow perch	281	46.73	20.9	15.68	5.0	12	.83	.4
Walleye	9	1.50	5.6	2.88	6.4	1	.25	.4
Rock bass	6	1.00	1.7	.45	0.7	-	-	-

Perch and black bullheads are only species found in greater abundance than the statewide average.

Shoreline Seining:

In .01 acres seined, 1 northern pike, 6 tadpole madtoms, 56 central johnny darters, and 3 blacksided darters were taken.

Fish Sizes:

Species	Number	Total Length in Inches Average	Minimum	Maximum
Common sucker	12	16.4	11.6	19.6
Black bullhead	100	7.5	3.9	11.9
Northern pike	5	20.5	14.4	25.4
Walleye	10	16.4	4.3	21.0
Yellow perch	100	8.5	6.3	9.4
Rock bass	6	7.3	6.0	7.5

Fish Growth Rates:

Not computed at time of report writing.

Fish Spawning Conditions:

Walleye - poor
Northern pike - good upstream
Panfish - poor

Fish Shelter Available:

Adequate shelter given by aquatic plants.

Fish Predators and Parasites Present:

Only predators noted were double-crested cormarant.
Only parasite noted was Neascus (black spot).

IV. Evidence of Erosion or Pollution.

None noted. Only slight basin-filling has occurred since construction of the dam (4.4% of storage is silted in).

V. Comparison with Previous Surveys.

No previous surveys conducted.

VI. Past Management.

Summary of Stocking Records:

September, 1945	Largemouth bass fingerlings	1,230
October, 1947	Walleye fingerlings	5,500
July, 1948	Walleye fingerlings	3,750
July, 1948	Largemouth bass fingerlings	2,800

VII. Present Use.

Recreational Development:

Lake is located in Lake Bronson State Park. There are 4 cottages near the lake with 35 boats on the lake.

Flood Control:

The lake is also used as a flood control reservoir.

Creel Census Records:

Angling: (Number of fish in parentheses)

Date	Number per Man Hour	Northern Pike	Walleye	Bullhead	Rock Bass
Winter, 1938-39	.44	.44	-	-	-
December, 1940	.80	.80 (8)	-	-	-
July, 1941	.95	.95 (189)	-	-	-
August, 1941	.33	.33 (73)	-	-	-
December, 1941	1.00	1.00 (3)	-	-	-
June, 1942	.89	.89 (240)	-	-	-
July, 1942	.63	.63 (97)	-	-	-
Winter, 1942-43	1.16	1.16 (7)	-	-	-
June, 1946	.70	.31 (77)	.37 (92)	.02 (5)	.26 (58)
July, 1946	.87	.24 (67)	.33 (97)	.26 (72)	.06 (17)
Average	.78				

Winter angling was better than summer angling but the yearly average was about 50% of the statewide average for the years 1938-42 and 1946.

Winter Spearing:

Date	Northern pike
1939-40	.86
January, 1941	.05
December, 1941	.95
January, 1942	1.32
Winter 1942-43	1.36
Winter 1945-46	.76
Average	.88

Winter spearing of northern pike in Lake Bronson was two times as great as the statewide average success.

III. Management Recommendations.

Management Policy.

Lake Bronson should be managed as a northern pike lake because of its location and ability to support that species of fish. Little can be done to alter fishing success in a river lake such as Bronson.

Physical Improvements.

None considered necessary. A stable water level should be sought.

Stocking Recommendations.

No recommendations.

Control of Fish Populations.

None needed at present. Bullheads are small, perch large, but their removal would not appreciably benefit the lake.

Recommended Regulations.

Spring and winter spearing of northerns is undesirable. No other angling regulations are suggested.

WATER ANALYSIS

State of Minnesota
DEPARTMENT OF CONSERVATION
DIVISION OF GAME AND FISH

B. F. 19

FISHERIES RESEARCH LABORATORY

SERIAL NO. 3170

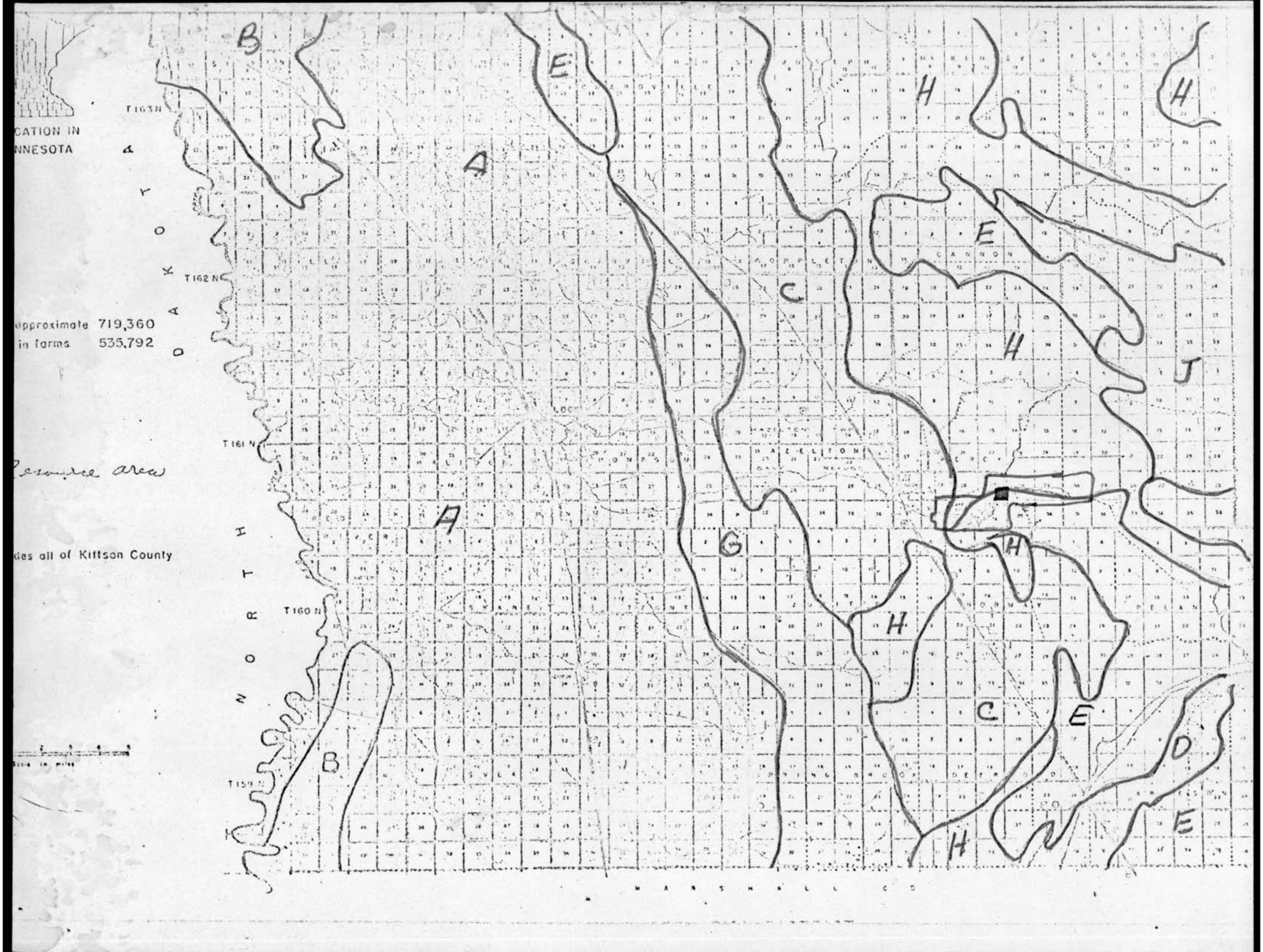
Lake
Stream Bronson Ident. No. ____ Co. Kittson

Description ____

Collector Moyle Date Oct 11, 1950 Preservative ____

Total Dissolved Solids		Determination By		Date	
Dish No.	Weight of Dish and Sample	Weight of Dish	Weight of Sample	Volume Water	P P M

SO_4 Ion	T. H. O	By	Date	11/20/50	93.6
Total P.	93	By	Date	"	.018
Soluble P.	98	By	Date	"	.005
Organic P.		By	Date	"	.013
Total Fe		By	Date	"	
Cl. Ion		By	Date	11/20/50	4.4
NH_3-N	96	By	Date	"	0.05
NO_2-N	100	By	Date	"	0
NO_3-N	89	By	Date	"	0.11
Organic N.	T.K.N. 58 0.89 180cc	By	Date	"	0.32
Total N.		By	Date	"	0.48
		By	Date		
		By	Date		
		By	Date	11/20/50	
		By	Date		
		By	Date		
		By	Date		
Total Alkalinity		By	Date	11/20/50	212.5
Color		By	Date		



CATION IN
NNESOTA
approximate 719,360
in farms 535,792
Resource area
des all of Kittson County
NORTH DAKOTA
T163N
T162N
T161N
T160N
T159N
CANNON
HAZELTON
NORWAY
PELAN
MARSHALL CO
A
B
C
D
E
G
H
J

AREA A - Area of dark, deep, moderate to heavy textured prairie soils having fair to poor internal drainage. The external drainage is slow due to the very level topography. The soils are derived from stone free heavy lacustrine deposits. A few streams dissect the area. This is the area of greatest agricultural development and includes most of the better agricultural land in the District. Fargo soils predominate. Drainage and wind erosion are the major problems.

AREA B - An area of dark colored, poorly to some what poorly drained silt loams and silty clay loams. These soils are developed on lacustrine silts and silt and clays mixed. The topography is many times characterized by micro-relief which results in a complex of soils. Excessive lime and wind erosion are problems with some areas needing improved drainage. These soils are very productive. The principle soils are Bearden and Colvin and the soil complex of Bearden, Colvin, Fargo.

AREA C - Area of moderately dark, deep, loamy sand and sandy loams having fair to poor drainage. Some small areas of heavy textured, imperfectly to poorly drained soils are included. A few areas are too stony for agricultural use. In the southern portion of this area, a few low sandy beach ridges are found. The majority of the soils are developed from light to moderately light textured lacustrine deposits over lake washed till or lacustrine clays at depths ranging from 2½ to 4'. The native vegetation is mainly popple with some open areas of grasses. A good portion of the area is cleared and more clearing is being done regularly. The main problems are drainage, wind erosion and maintenance of organic matter content. The major soils are Ulen, Fossum, Grimstad.

AREA D - This area is made up largely of gravel ridges and gravelly wet lands. The region has many hazards - the coarseness of the soil material, the low water holding capacity and the subsequent drought problems, the low inherant fertility, and the susceptibility to wind erosion. The low wet lands often have an excess of lime. The main soils are Sioux, Mavie and Hangaard.

AREA E - The soils of these areas are derived from limy clay loam glacial till that has been reworked by lake waters. The native vegetation was largely popple interspersed with open areas of grass. The topsoil is thin and has a loam texture. Locally there are areas of sandy soil. Frequently at depths ranging from 12 to 18 inches, a layer of coarse gravel and cobblestone is encountered. This layer is from a few inches to over 12 inches in thickness. This layer rests directly on the limy clay loam till material that has been reworked by the action of lakewaters. Stones and boulders are of common occurrence. Drainage is generally poor. Very little of these areas are now in cultivation, except for the area south of Pelan where there is considerable agricultural development. Lack of drainage and stones are the principal hazards to the development of this area. The principal soils are Kittson, Nereson, Rocksbuy and Mavie.

AREA G - Area of dark, deep, medium textured prairie soils having generally fair to imperfect internal drainage. The external drainage is poor due to the level topography. Some small low wet depressional areas are included. The soils are developed from moderately light to medium textured stone free lacustrine deposits which varies in depth over lake washed till or lacustrine clay. The generally medium textured surface material extends to about 18 inches before grading into more sandy material. The depth to the heavy lake washed till or lacustrine clays varies from 2½ to 4'. This area is very well developed agriculturally. Grimstad and Ulen, and Rockwell loams, and fine sandy loams predominate. Drainage and wind erosion are the major problems.

AREA H - Most of the soils of this area are light colored to moderately dark colored loamy sands and sands. There are local areas of heavy soils and these areas are usually stony. Some areas of peat have also been included. The native vegetation is largely popple mixed with some oak. Wherever the timber stands are thin, there is a ground cover of grasses. Drainage ranges from fair to poor. Only a small per cent of this area is now under cultivation because of drainage problems and the sandy nature of the soil. The predominant soils are Grygla, Cormant, Redby and Hiwood.

AREA J - The peat ranges in depth from 1 to 5 feet or more, although most of it is less than 3 feet thick. Sand underlies the peat in some places; in other places, clay loam till is found. In part of the area, the peat has been burned off. Very little of the area is under cultivation. The major hazards to farming this area are fire, frost, low fertility, and excessive water/

Keep

ADDENDUM

LAKE BRONSON STATE PARK

~~Addendum to~~ Environmental Assessment ~~Submitted with LAWCON Project~~
LW #27-00
241

I. <u>Description of the Proposed Action</u> - ~~Lake Bronson State Park was created by an act of the Minnesota State Legislature in 1937.~~

The Minnesota Department of Natural Resources intends to increase the quality of outdoor recreational opportunities at Itasca State Park by improving existing and developing new facilities.

The Bureau of Outdoor Recreation, as Federal administering agnecy for the Land and Water Conservation Fund (LAWCON), is requested to participate with the State of Minnesota in the proposed projects.

The proposed projects include:

1) Construction of Park Entry Portal	$1,500
2) Development of Interpretive Displays	$10,000
3) Rehabilitation of Picnic Sanitation Bldg.	$5,000
4) Development of Picnic Area Walkways	$750
5) Campground Development	$23,000
6) Remodel Campground Sanitation Bldg.	$20,000
7) Construct Boat Launch and Docking Area	$5,500
8) Develop Trails	$17,500
9) Construct Trail Bridges	$25,000
10) Install Picnic Area Water Lines	$15,000
11) Conduct Spillway and Impoundment Study	$23,000
12) Implement Fisheries Management Project	$3,000
13) Stabilize Bank Erosion on Lakeshore	$8,000
14) Vegetation Management	$30,800
15) Cultural Resource Survey of Project Sites	$5,500

The total cost of the proposed projects is $193,550. State funds are available for completion of the projects, scheduled to be concluded by the end of the 1979 construction season.

II. Description of the Environment - Provided previously in the environmental assessment for Lake Bronson LAWCON project LW27 00

III. Environmental Impact of the Proposed Action - Under the Minnesota Outdoor Recreation Act of 1975, a comprehensive management plan has been developed for Lake Bronson State Park. Development funds will be released upon final approval of the park master plan, which sets forth the development proposals listed in this assessment. Proposals followed a two-year multidisciplinary study of park needs and possible impacts of management alternatives.

Proposed actions fall into four general categories: research, rehabilitation, resource management and development. A cutural resource site survey will be conducted on all locations prior to project implementation (map attached). Another study on the feasibility of an upstream impoundment to upgrade water quality an reduce silt load, plus assessing possible effects of dam failure and new spillway on downstream communities will be conducted. Neither of these actions will significantly affect the environment, although findings of these investigations could eventually lead to enhancement of the park and surrounding area.

Rehabilitation projects include stabilization of bank erosion along the shores of the impoundment, and the remodeling of picnic ground and campground sanitation buildings. Aside from extremely localized disruption of fauna and flora, no adverse impacts on physical or biological resources. Preliminary cultural resource surveys should preclude accidental disruption of archaeological or historical sites, and if evidence is uncovered, work will be stopped until it can be assessed. The local economy should benefit somewhat from the resulting increased attractiveness of the park to tourists.

Resource Management projects include fisheries survey and stocking; fencing, controled burning and some sod transplants in prairie remnant and other naturally unique environments; and sanitation cuts and revegetation in campground areas. Vegetation management areas and proposed techniques are appended. Fencing is designed to restrict recreational vehicle access to fragile sand dune/ creeping juniper communities so that they can recover from previous abuse. Controledburning and selective sod transplants will be used to increase the vitality of prairie environments in management areas. Although these management activities are designed to cause shifts in species composition and density favoring certain native varieties, no adverse impacts on physical, biotic or other park resources are anticipated.

Development projects include an entry portal, interpretive display, picnic area walkways and water lines, improvements on campground and trails, including two trail bridges, and a boat launch and docks. Some local disruption of flora and fauna will occur in and adjacent to development sites. Since no historical or archaeological sites are known in proposed development areas, no adverse impacts to these resources are anticipated. However, a site survey will be conducted on each development project location prior to implementation.

IV. MITIGATING MEASURES INCLUDED IN THE PROPOSED ACTION

Both rehabilitation and development of new facilities will mitigate against long-term impact of overintensive use, which has been a long-standing problem at Lake Bronson State Park. Upgraded sanitation facilities will afford improved access to the handicapped. Improved trail systems will better disperse users throughout the park and aid the development of interpretive programs.

V. UNAVOIDABLE ADVERSE ENVIRONMENTAL IMPACTS

Development of certain facilities, especially trails and boat launching site, will shift patterns of use to new areas of the park, subjecting these areas to new pressures. This may result in increased littering, vandalism, wildfire, and displacement of certain wildlife species. There will be direct loss of localized plant and animal life in and around development sites.

VI. RELATIONSHIPS OF SHORT-TERM USES AND LONG-TERM PRODUCTIVITY

Because of increasing recreational use of Lake Bronson and the need to provide additional and improved facilities or management, short-term losses are outweighed by long-range productivity.

GAINS	LOSSES
1. Improved Interpretive Media	1. Expenditure of $193,550 of public funds.
2. Improved Sanitation Facilities	2. Loss of local flora/fauna in project areas.
3. Improved Camping/Picnicing	

GAINS	LOSSES

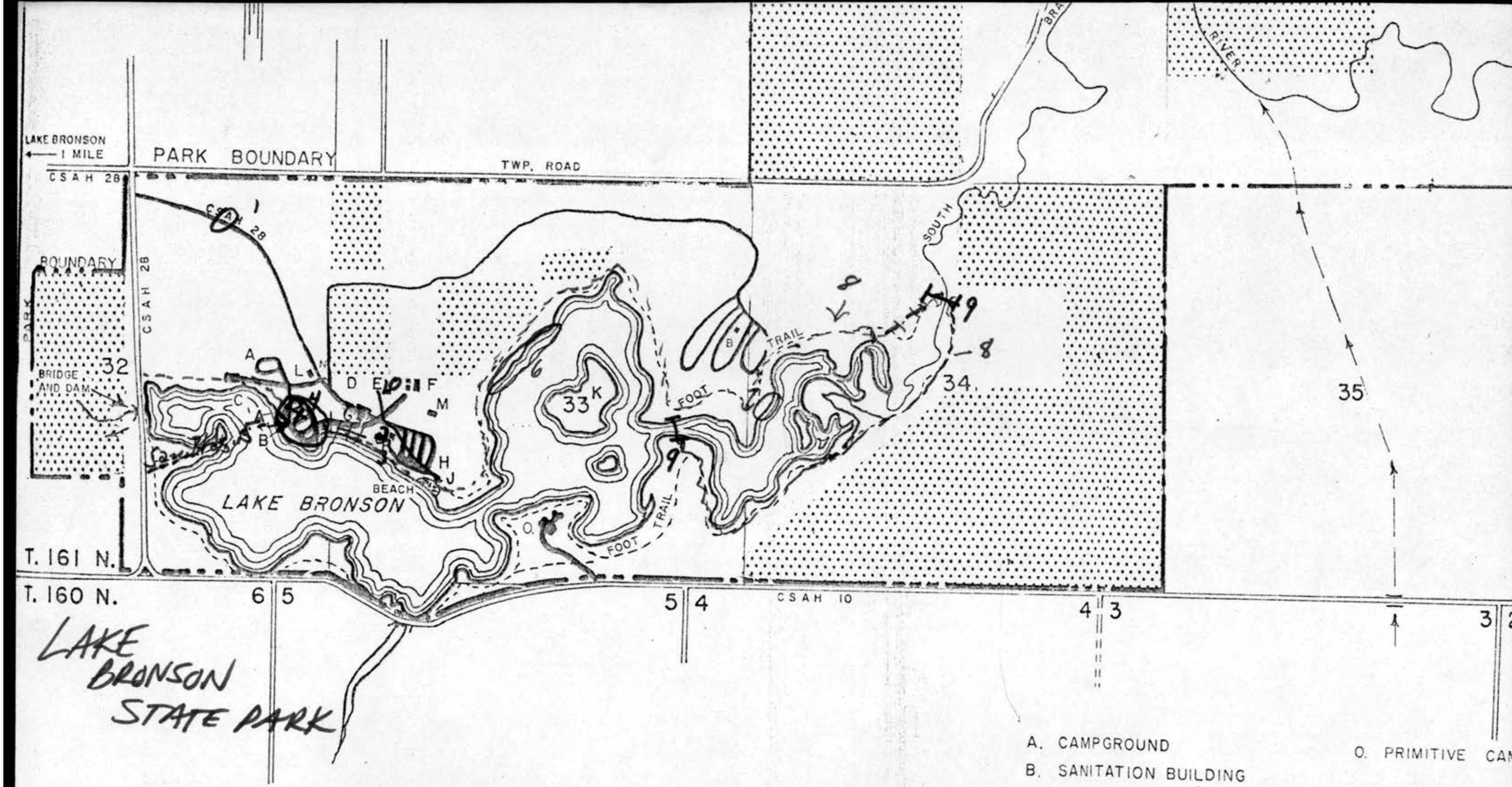
4. Improved Management of Resources
5. Improved Trail and Lake Access
6. Improved Cultural Resource Inventory
7. Economic Gain to Local Community through Contracting, etc.

VII. IRREVERSABLE OR IRRETRIEVABLE COMMITMENT OF RESOURCES

Project implementation will result in increased attractiveness of the area to recreationists and enhanced value of nearby recreational lands. The manpower, materials and funds necessary to carry out the project will also be irretrievably committed.

VIII. ALTERNATIVES TO THE PROPOSED ACTION

Major Alternatives considered are 1) no action and 2) a project of larger scope. In 1, failure to develop and upgrade necessary facilities could result in accelerated degradation of resources. The park master planning process has clearly demonstrated the need for facilities and improvements included in the project. In 2, more extensive work is not judged necessary at this time, under project phasing outlined in the plan.



SCALE: 3" = 1 MILE

STATUTORY BOUNDARY 2983 ACRES (APPROX.)

A. CAMPGROUND
B. SANITATION BUILDING
C. BOAT LANDING
D. TEMP. CONTROL STATION
E. WATER TOWER (OBSERVATION TOWER)
F. GARAGE AND SHOP
G. RESIDENCE
H. PICNIC GROUNDS
J. BATH HOUSE
K. BIRD SANCTUARY
L. CONTACT STATION
M. LOG CABIN
N. TRAILER DUMP STATION
O. PRIMITIVE CAM

PROJECT SITES

1 Entrance Portals
2 Picnic San. Blds
3 Picnic area walks
4 Campground develope
5 San. blds. remodel
6. Docks for Cabins
7. Boat Launch area
8. Trail Devt.
9 Trail bridges
10 Water Lines
11. Upstream from park (watershed study)

LAKE BRONSON

Tract	Name of Owner	Acres	Est. Cost	
1	Kittson County DO unwilling	20.00	$ 3,000	3,600
2	Baptist Bible Camp DO unwilling	21.50	23,000	27,600
21	Ore Ida Foods Inc.	32.02	6,600	7,920
13, 16 17, 24-59	Lakeside Subdivision } 8 being appraised	19.73	40,000	48,000
60	Paul Gillie being appraised	7.00	1,400	1,680
	TOTAL (No. of Parcels) 42	100.25	$ 74,000	88,800

14,800

50 Total Parcels

14,800
5 | 74,000
24
40

3,031
1329 private
1,702 public

62,800
5 | 314,000
14
40

43
3031 | 1329.000
12124
11660
993

314,000
63000
375,000

100.25
369.00
860.00
1329.25

74,000
83,000
157,000
314,000

3/11/75

a

LAKE BRONSON

Tract	Name of Owner	Acres	Est. Cost
8A	Marvin Johnson * } unwilling	160.00	$50,000
8B	Marvin Johnson *	80.00	- -
8C	Marvin Johnson *	80.00	- -
6A	Galilee Bible Camp * unwilling	9.00	25,000
20	Northern Foods Inc. Being appraised new owner	40.00	8,000
5		369.00	$83,000
15	WESLEY HAZELTON * being appraised	380.00	57,000
6		749.00	140,000
		-22.00	

b

Tract	Name of Owner		Acres		Est. Cost
~~15~~	~~Wesley I. Hazelton~~		~~380.00~~		~~$ 57,000~~
9A	Midwest Potato Co.	still being negotiated with new owners	160.00	→	100,000
9B	Midwest Potato Co.		320.00		- -
~~3~~ 2			~~860.00~~ 380 480,00		~~$157,000~~ 57 100,000

ADDENDUM

LAKE BRONSON STATE PARK

ENVIRONMENTAL ASSESSMENT

LW27-00741

I. DESCRIPTION OF THE PROPOSED ACTION - The Minnesota Department of Natural Resources intends to increase the quality of outdoor recreational opportunities at Bronson State Park by improving existing and developing new facilities.

The Bureau of Outdoor Recreation, as Federal administering agency for the Land and Water Conservation Fund (LAWCON), is requested to participate with the State of Minnesota in the proposed projects.

The proposed projects include:

1)	Construction of Park Entry Portal	1,000.00
2)	Development of Interpretive Displays	7,000.00
3)	Renovation of Picnic Sanitation Bldg.	4,000.00
4)	Development of Picnic Area Walkways	700.00
5)	Campground Development	12,500.00
6)	Renovate Campground Sanitation Bldg.	15,000.00
7)	Erosion Control in boat launch area and construct docks	3,000.00
8)	Develop Trails	12,000.00
9)	Construct Trail Bridges	25,000.00
10)	Install Picnic Area Water Lines	10,000.00
11)	Stabilize Bank Erosion on Lakeshore	8,000.00
12)	Vegetation Management	30,800.00
13)	Planning and Engineering	46,000.00

The total cost of the proposed projects is $175,000.00. State funds are available for completion of the projects, scheduled to be concluded by the end of the 1979 construction season.

II. DESCRIPTION OF THE ENVIRONMENT - Provided previously in the environmental assessment for Lake Bronson LAWCON project - LW27-00741.

III. ENVIRONMENTAL IMPACT OF THE PROPOSED ACTION - Under the Minnesota Outdoor Recreation Act of 1975, a comprehensive management plan has been developed for Lake Bronson State Park. Development funds will be released upon final approval of the park master plan, which sets forth the development proposals listed in this assessment. Proposals followed a two-year multidisciplinary study of park needs and possible impacts of management alternatives.

Proposed actions fall into four general categories: planning, renovation, resource management, and development. A cultural resource site survey will be conducted on all locations prior to project implementation (map attached). Another study on the feasibility of an upstream impoundment to upgrade water quality and reduce silt load, plus assessing possible effects of dam failure and new spillway on downstream communities will be conducted. Neither of these actions will significantly affect the environment, although findings of these investigations could eventually lead to enhancement of the park and surrounding area.

Renovation projects include stabilization of bank erosion along the shores of the impoundment, and the renovation of picnic ground and campground sanitation buildings. Aside from extremely localized disruption of fauna and flora, no adverse impacts on physical or biological resources will occur. Preliminary cultural resource surveys should preclude accidental disruption of archaeological or historical sites, and if evidence is uncovered, work will be stopped until it can be assessed. The local economy should benefit somewhat from the resulting increased attractiveness of the park to tourists.

Resource Management projects include fencing; controlled burning; and some sod transplants in prairie remnant and other naturally unique environments; and sanitation cuts and revegetation in campground areas. Vegetation management areas and proposed techniques are appended. Fencing is designed to restrict recreational vehicle access to fragile sand dune/creeping juniper communities so that they can recover from previous abuse. Controlled burning and selective sod transplants will be used to increase the vitality of prairie environments in management areas. Although these management activities are designed to cause shifts in species composition and density favoring certain native varieties, no adverse impacts on physical, biotic, or other park resources are anticipated.

Development projects include an entry portal, interpretive displays, picnic area walkways and water lines, improvements on campground and trails, including two trail bridges, and erosion control in boat launch area and construct docks. Some local disruption of flora and fauna will occur in and adjacent to development sites. Since no historical or archaeological sites are known in proposed development areas, no adverse impacts to these resources are anticipated. However, a site survey will be conducted on each development project location prior to implementation.

IV. MITIGATING MEASURES INCLUDED IN THE PROPOSED ACTION

Both renovation and development of new facilities will mitigate against long-term impact of overintensive use, which has been a long-standing problem at Lake Bronson State Park. Upgraded sanitation facilities will afford improved access to the handicapped. Improved trail systems will better disperse users throughout the park and aid the development of interpretive programs.

V. UNAVOIDABLE ADVERSE ENVIRONMENTAL IMPACTS

Development of certain facilities, especially trails and boat launching site, will shift patterns of use to new areas of the park, subjecting these areas to new pressures. This may result in increased littering, vandalism, wildfire, and displacement of certain wildlife species. There will be direct loss of localized plant and animal life in and around development sites.

VI. RELATIONSHIPS OF SHORT-TERM USES AND LONG-TERM PRODUCTIVITY

Because of increasing recreational use of Lake Bronson and the need to provide additional and improved facilities or management, short-term losses are outweighed by long-range productivity.

GAINS	LOSSES
1. Improved Interpretive Media	1. Expenditure of $175,000 of public funds.
2. Improved Sanitation Facilities	2. Loss of local flora/ fauna in project areas.
3. Improved Camping/Picnicking	

GAINS	LOSSES

4. Improved Management of Resources
5. Improved Trail and Lake Access
6. Improved Cultural Resource Inventory
7. Economic Gain to Local Community through Contracting, etc.

VII. IRREVERSIBLE OR IRRETRIEVABLE COMMITMENT OF RESOURCES

Project implementation will result in increased attractiveness of the area to recreationists and enhanced value of nearby recreational lands. The manpower, materials, and funds necessary to carry out the project will also be irretrievably committed.

VIII. ALTERNATIVES TO THE PROPOSED ACTION

Major alternatives to the action considered are 1) no action and 2) a project of larger scope. In 1, failure to develop and upgrade necessary facilities could result in accelerated degradation of resources. The park master planning process has clearly demonstrated the need for facilities and improvements included in the project. In 2, more extensive work is not judged necessary at this time, under project phasing outlined in the plan.