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# IOWA-CEDAR

## RIVERS BASIN STUDY



### INVENTORY REPORT CEDAR RIVER SUBBASIN

U.S. DEPARTMENT OF AGRICULTURE

Soil Conservation Service  
Economic Research Service  
Forest Service

876

UNITED STATES DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE

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823 Federal Building, Des Moines, Iowa 50309

Mr. William H. Greiner  
Chairman  
Iowa-Cedar Rivers Basin Coordinating Committee  
Grimes Building, E. 14th and Grand Avenue  
Des Moines, Iowa 50319

Dear Mr. Greiner:

The cooperating Federal and State agencies have been accumulating data for various subbasins within the Iowa-Cedar Rivers Basin since the beginning of the river basin study. Much of this data and information is useful to local decision makers in its present form. We have summarized this data in report form and are furnishing to you an Inventory Report for each subbasin.

The Inventory is not a finished report. It is merely a collection and summarization of data from many sources. We, the cooperating agencies, have recommended no action in this report.

We do not recommend widespread distribution of the Inventory Reports. We do feel that the reports will be useful to local units of government, planning agencies and others who need resource inventory information on which to base land use decisions.

Copies are being furnished so that you may make distribution as you see fit within the subbasin areas.

Sincerely,

*Kenneth G. McManus*

Wilson T. Moon  
State Conservationist *actg.*  
Chairman  
USDA Field Advisory Committee



INVENTORY REPORT  
CEDAR RIVER SUBBASIN  
Iowa-Cedar Rivers Basin

I. DESCRIPTION

A. Drainage Area

The Cedar River Subbasin extends from southern Dodge County, Minnesota, southeastward through east central Iowa to Muscatine County (Figure 1). Here it joins the Iowa River. For the purpose of this study, the Subbasin excludes the drainage areas of the West Fork Cedar River (1,556 square miles) and the Shell Rock River (1,083 square miles). These Subbasins are considered in separate inventory reports. The Cedar River Subbasin encompasses 5,180 square miles or 3,315,200 acres. About 1,000 square miles are located in southern Minnesota.

The Cedar River rises in marshy depressions in the glacial drift lake region of south-central Minnesota, near Hayfield. It flows in a southeasterly direction through east-central Iowa and joins the Iowa River at Fredonia, Iowa. The Subbasin is long and narrow with a maximum width of about 45 miles.

Major tributaries of the Cedar, in addition to those mentioned above, are Prairie Creek, Wolf Creek, Black Hawk Creek, Beaver Creek and the Little Cedar River.

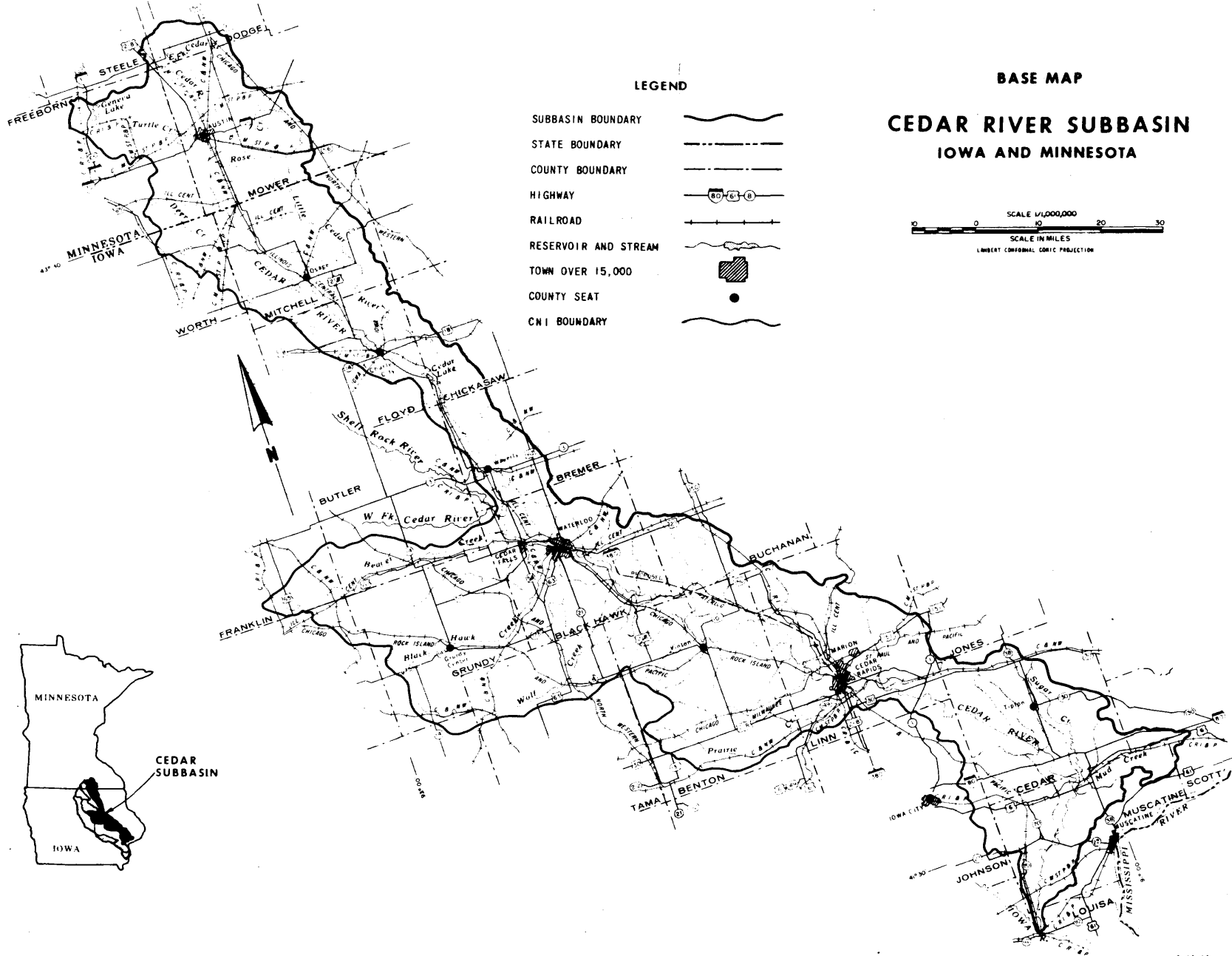
B. Climatic Data

The climate of the Subbasin is typical continental. In the northern part of the Subbasin, the average annual temperature is about 46° F. The frost-free growing season averages 155 days. In the southern part of the Subbasin, the average annual temperature is about 50° F. and the frost-free growing season is 170 days.

From north to south, the average annual precipitation and snowfall are 29 inches and 35 inches and 48 inches and 26 inches respectively.

C. Economy

The 1970 population of the Cedar River Subbasin was 454,000. Of these, 79 percent, or 357,000 live in urban areas; nine percent, or 42,000 are rural non-farm residents; and the remaining 12 percent, or 55,000 persons live on farms. The Subbasin makes up 40 percent of the area of the Iowa-Cedar Rivers Basin and has 55 percent of its population.



**LEGEND**

- SUBBASIN BOUNDARY
- STATE BOUNDARY
- COUNTY BOUNDARY
- HIGHWAY
- RAILROAD
- RESERVOIR AND STREAM
- TOWN OVER 15,000
- COUNTY SEAT
- CNI BOUNDARY

**BASE MAP**  
**CEDAR RIVER SUBBASIN**  
**IOWA AND MINNESOTA**

SCALE 1/1,000,000  
 SCALE IN MILES  
 0 10 20 30  
 LAMBERT CONFORMAL CONIC PROJECTION

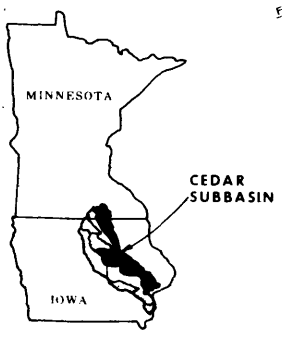


Figure 1

SOURCE: U.S. GEOLOGICAL SURVEY, 1:500,000 BASE MAPS, IOWA AND MINNESOTA, 1954; U.S. GEOLOGICAL SURVEY, 1:500,000 AEROPHOTOCALIC CHARTS (DES MOINES AND DUBUQUE); USDA SOIL CONSERVATION SERVICE, 1970

Manufacturing, wholesaling and retailing, and agriculture were the three largest sources of employment in the Subbasin. Manufacturing, the largest employer, increased by 21 percent between 1950 and 1960, wholesaling and retailing, the next largest employer, increased 9 percent during this period. Agriculture, ranking third in employment, decreased by 26 percent from 1950 to 1960. Finance, insurance and real estate was up by about 40 percent while construction and transportation and utilities remained fairly constant.

Family income was distributed as follows in the Subbasin in 1960:

| <u>Income Category</u> | <u>Cedar Subbasin</u><br>(percent) | <u>Iowa-Cedar River Basin</u><br>(percent) |
|------------------------|------------------------------------|--|
| Less than \$3000       | 25                                 | 27   |
| \$3000 to \$10,000     | 64                                 | 63   |
| More than \$10,000     | 11                                 | 10   |

The total number of farms declined from 24,265 farms in 1950 to 17,351 in 1970, a 29 percent decrease.

Livestock farms other than dairy or poultry farms are the largest and represented 43 percent of the farms in 1965 compared to 53 percent in 1950. The decline in actual number of farms classified in the category was 4,741 farms or 37 percent from 1950. Poultry farms also decreased 64 percent over this period; but dairy increased 81 percent.

Cash grain farms have increased from 2,384 farms in 1950 to 3,772 farms in 1965. This represents a 58 percent increase and a change from 10 to 20 percent of the total number of farms.

Farms classified as other farms increased from 2,151 to 2,196 farms, an increase of 2 percent between 1950 and 1965. Therefore, the category increased from 9 to 12 percent of the total number of farms.

Average farm size in the Subbasin was 214 acres in 1970, an increase of 57 acres per farm from 1950. The 1970 average value of land and buildings in the Subbasin is approximately \$448 per acre. This represents an approximate investment of \$95.4 thousand in land and buildings by each farm operator in the Subbasin.

The trend in the Subbasin in farm tenure from 1950 to 1970 has been decreased in the percentage of full owners and tenants, and an increase in the percentage of part-owners. (Table 1)

In 1950, full-owners accounted for 49 percent of the farm tenure. This increased to 54 percent of the farm tenure in 1970. At the same time, the percentage of part-owners has increased from 14 percent in 1950 to 24 percent in 1970. This may be explained by the consolidation of farm units and capital accumulation. The number of tenants has dropped 56 percent during this 20 year period and has dropped from 36 to 22 percent of total tenure.

TABLE 1 - FARM TENURE  
Cedar River Subbasin  
Iowa-Cedar Rivers Basin

| Year | Full<br>Owners | Part<br>Owners | Managers | Tenants | Total  |
|------|----------------|----------------|----------|---------|--------|
| 1950 | 11,895         | 3,445          | 86       | 8,841   | 24,267 |
| 1954 | 11,611         | 3,407          | 54       | 8,392   | 23,465 |
| 1960 | 10,887         | 3,757          | 49       | 6,809   | 21,501 |
| 1964 | 9,415          | 3,903          | 65       | 5,614   | 18,997 |
| 1970 | 9,364          | 4,119          | -        | 3,869   | 17,351 |

Source: U. S. Department of Commerce, Bureau of Census, Agriculture Census, 1950, 1959, 1964, 1970.

Crop and livestock sales in the Subbasin totaled 411.3 million dollars in 1970. Livestock and livestock sales accounted for 74 percent of crop and livestock sales by farmers in the Subbasin (Table 2). This share of total sales was down from 82 percent in 1950. Receipts from dairy products in the Subbasin have remained fairly constant as a proportion of the total livestock sales. Receipts from poultry and poultry products in the Subbasin have declined both in actual numbers and as a share of total livestock sales. Other livestock and livestock products sales have increased both in numbers and as a share of total livestock sales -- increasing from 78 to 85 percent of livestock sales.

Crop sales have almost tripled during the period 1950-70. Field crops are by far the largest source of crop receipts accounting for over 90 percent in 1950 and 1970.

The use of commercial fertilizers and agricultural chemicals in recent years has been one means by which the farmer could increase production without expanding the size of operation. Herbicides have, in certain instances, taken the place of hired labor which, at times is in short supply.

These factors have helped to make expenditures for fertilizer and chemicals a very important input to agriculture. The amount of fertilizer used in the Subbasin has more than doubled between 1955 and 1970 (Table 3). The use of lime remained about constant for this period.

The use of herbicides and insecticides has become increasingly more important to the agriculture industry. The use of chemicals is expected to be more extensive in the future. Prior to 1964, census data are not available, but an indication of current usage is given in Table 3.

#### D. Physiography and Geology

The Cedar River Subbasin incorporates portions of many counties along its drainage way from north-central to east-central Iowa. Those counties which make up the greater part of the area in Iowa include Mitchell, Floyd, Bremer, Black Hawk, Grundy, Benton, Linn, Cedar, and Muscatine. The Cedar River actually rises in Dodge County, Minnesota, north of Austin at an elevation of approximately 1300 feet. This part of Dodge County, plus larger segments of Mower and Freeborn Counties, round off the northernmost segment of the Cedar River Subbasin. The major tributaries joining the Cedar along the length of her course include the Little Cedar River, the West Fork Cedar River, Beaver Creek, Black Hawk Creek and Prairie Creek. The combined drainage of the Cedar Subbasin empties into the Iowa River at Columbus Junction in northern Louisa County at an elevation of 570 feet.

The landscape through which most of the Cedar River makes its valley is quite uniform and only locally is the gently rolling landscape roughened by bands of hills. From Mitchell County south-eastward to southern Linn County, the Subbasin reflects the subdued gentle curves of the "Iowan Surface", a plain developed on Kansan-age glacial deposits and mantled by a thin, discontinuous cover of wind-blown silt called loess. The landscape is generally well drained, though definite stream channels are often hard to

TABLE 2 - CROP AND LIVESTOCK SALES  
 Cedar River Subbasin  
 Iowa-Cedar Rivers Basin  
 (1000 dollar)

|   | 1950    | 1955    | 1960    | 1965    | 1970    |
|---|---------|---------|---------|---------|---------|
| Crop sales  | 37,444  | 54,012  | 63,107  | 79,519  | 105,702 |
| Grains  | 34,412  | 50,226  | 59,023  | 75,699  | 96,288  |
| Field seeds & roughage                                    |         |         |         |         | 2,975   |
| Other crops   |         |         |         |         | 1,913   |
| Vegetables  | 1,995   | 2,072   | 1,687   | 1,700   | 1,945   |
| Fruit, nuts & berries                                     | 135     | 57      | 129     | 67      | 339     |
| Nursery & greenhouse                                      | 860     | 1,600   |         |         | 2,343   |
| Forest products   | 41      | 55      | 2,269   | 2,062   | 80      |
| Livestock sales   | 165,607 | 182,384 | 229,625 | 229,428 | 305,560 |
| Poultry & poultry products                                | 16,487  | 14,562  | 13,293  | 12,858  | 12,278  |
| Dairy products  | 20,109  | 20,844  | 24,782  | 32,336  | 32,942  |
| Dairy cattle & calves                                     |         |         |         |         | 9,622   |
| Other cattle & calves                                     |         |         |         |         | 128,966 |
| Hogs, sheep & goats                                       |         |         |         |         | 121,342 |
| Other livestock & products                                |         |         |         |         |         |
| Livestock & livestock products other than dairy & poultry | 129,011 | 146,978 | 191,550 | 184,234 | 259,930 |
| Total Sales   | 203,051 | 236,396 | 292,732 | 308,947 | 411,262 |

Source: U. S. Department of Commerce, Bureau of Census, Agriculture Census: 1950, 1954, 1959, 1964, 1969.



TABLE 3 - FERTILIZER & LIME USED ON FARMS  
 Cedar River Subbasin  
 Iowa-Cedar Rivers Basin

|  | 1955    | 1960      | 1965      | 1970      |
|--|---------|-----------|-----------|-----------|
| <b>Fertilizer</b>                            |         |           |           |           |
| Number of farms                              | 15,343  | 14,923    | 15,177    | 11,809    |
| Amount in tons                               | 86,892  | 105,682   | 133,839   | 203,650   |
| Area applied in acres                        | 990,718 | 1,186,981 | 1,268,721 | 1,238,488 |
| <b>Lime</b>                                  |         |           |           |           |
| Number of farms                              | 5,689   | 3,118     | 3,987     | 3,012     |
| Total amount in tons                         | 330,474 | 216,317   | 304,253   | 330,173   |
| Area applied in acres                        | 139,604 | 88,992    | 135,796   | 127,800   |
| <b>Agricultural chemicals</b>                |         |           |           |           |
| Control of crop insects (acres)              |         |           | 217,596   | 485,501   |
| Control of weeds, grass<br>and brush (acres) |         |           | 619,627   | 1,000,211 |
| Control of livestock<br>insects (head)       |         |           | 1,145,161 |           |
| (farms)                                      |         |           | 8,567     | 3,617     |

Source: U. S. Department of Commerce, Bureau of Census, Agriculture Census: 1954, 1959, 1964, 1969.

define as their valleys merge almost imperceptibly to the general level of the surrounding terrain. Also characteristic of the Iowan plain are scattered "glacial erratics" or boulders, giving further evidence of the glacial origins of the landscape. Elliptical hills, each oriented along a northwest-southeast axis and capped by thick deposits of loess, are also characteristic of the Iowan Surface. Concentrations of these paha, as they are known, are located across the drainage basin, primarily in central Benton and southern Linn Counties and account for most of the topographic relief in the Iowan Surface area.

In southern Linn County, the Iowan terrain gives way to a more deeply carved and dissected segment of weathered Kansan till, thickly mantled with loess. This older and rougher terrain characterizes the topography of the Subbasin only as far as southern Cedar County where the valleys enlarge into broad reentrants and then into the open plains of glacial Lake Calvin. At Moscow, in northern Muscatine County, the Cedar River itself takes a sharp angular bend to the southwest and into the vast topographic lowlands of Lake Calvin, characterized by broad flood plains and terraces, sand dunes and backwater sloughs. The materials underlying this terrain are water-deposited sands and gravels, silts and clays. It is within the confines of the Lake Calvin basin, bounded abruptly on the south by the Illinoian glacial drift uplands, that the Cedar River Subbasin terminates and its drainage is channeled into that of the Iowa River Subbasin.

Inequalities in the thickness of the loess and the glacial deposits, particularly in the region of the Iowan Surface, provide considerable variety to the character of the Cedar Valley itself. The subdued landscape of the Iowan is a function not only of glacial activity, but of nearly horizontal sedimentary rocks lying close to the surface. The Cedar River valley alters its appearance throughout its length depending on the type of materials in which the valley is cut. In places, the valley is wide and its sides merge with a gentle gradient to the surrounding uplands. Broad sand and gravel terraces may border the floodplain of the meandering river. In contrast are narrow stretches of the river valley, confined by precipitous limestone bluffs. Here the valley is trenched directly into resistant bedrock, and there is only a thin veneer of loess or glacial drift at the surface. The Cedar River is similarly entrenched through the areas where paha are concentrated.

The geological formations which form the bedrock surface throughout the Subbasin are primarily limestones and dolomites of Devonian and Silurian age. From the northernmost portion south to Bremer County, the Cedar valley units of Middle Devonian age dominate the bedrock surface (Figures 2 and 3). From this area on south, the Subbasin widens to the west to include the outcrop belts of the Lime Creek formation and the Yellow Spring Group. These units are composed of shales and dolomites and are Upper Devonian in age. Along the eastern portion of the Subbasin, from Bremer County on south, the outcrop belt of the Cedar Valley formation narrows and accommodates the limestones and dolomites of the Devonian



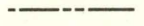
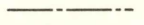



# BEDROCK MAP IOWA-CEDAR RIVERS BASIN

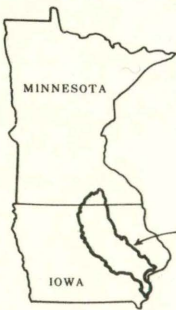
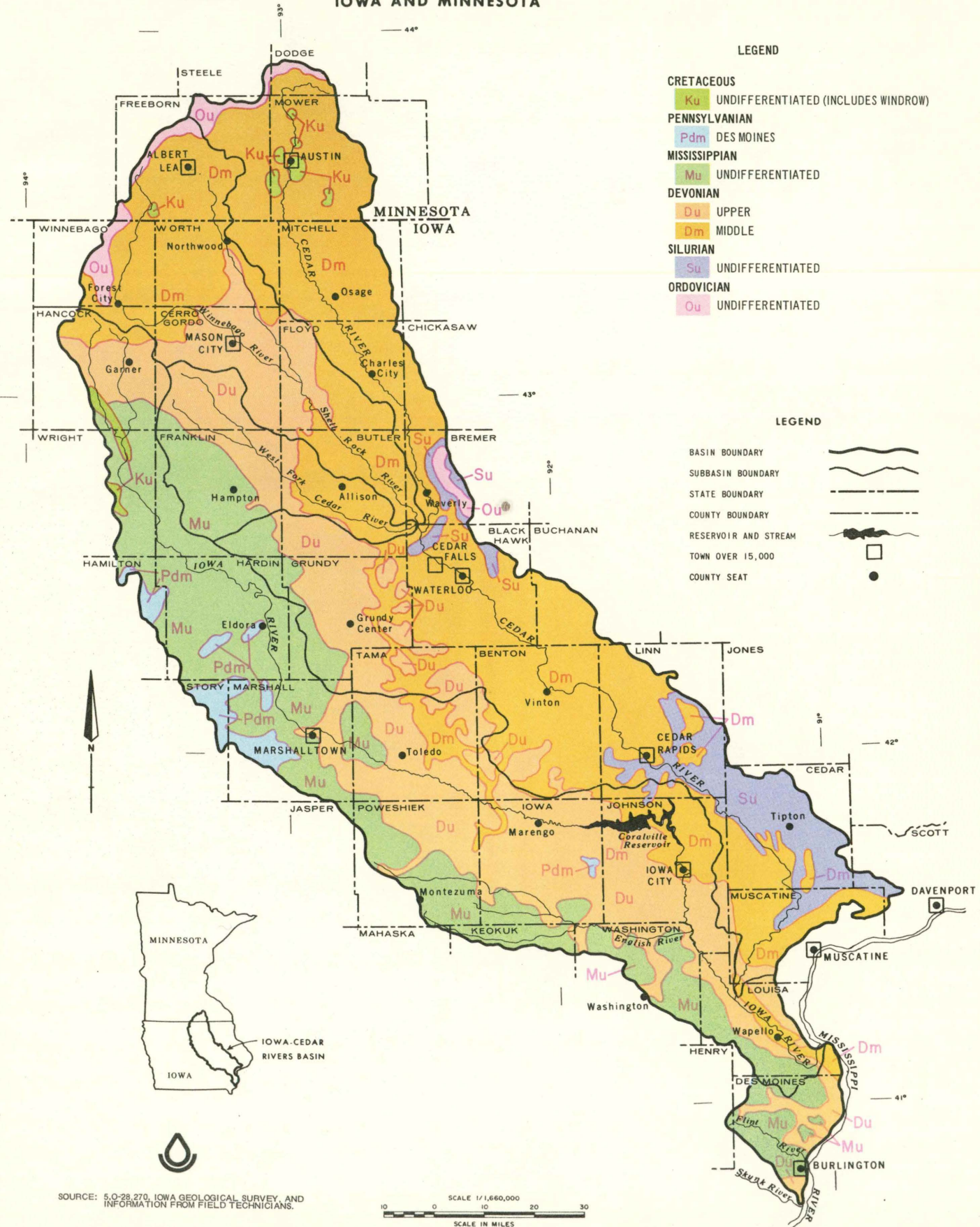
## IOWA AND MINNESOTA

### LEGEND

- CRETACEOUS**
  - Ku UNDIFFERENTIATED (INCLUDES WINDROW)
- PENNSYLVANIAN**
  - Pdm DES MOINES
- MISSISSIPPIAN**
  - Mu UNDIFFERENTIATED
- DEVONIAN**
  - Du UPPER
  - Dm MIDDLE
- SILURIAN**
  - Su UNDIFFERENTIATED
- ORDOVICIAN**
  - Ou UNDIFFERENTIATED

### LEGEND

- BASIN BOUNDARY 
- SUBBASIN BOUNDARY 
- STATE BOUNDARY 
- COUNTY BOUNDARY 
- RESERVOIR AND STREAM 
- TOWN OVER 15,000 
- COUNTY SEAT 



SOURCE: 5,0-28,270, IOWA GEOLOGICAL SURVEY, AND INFORMATION FROM FIELD TECHNICIANS.

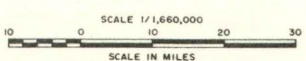
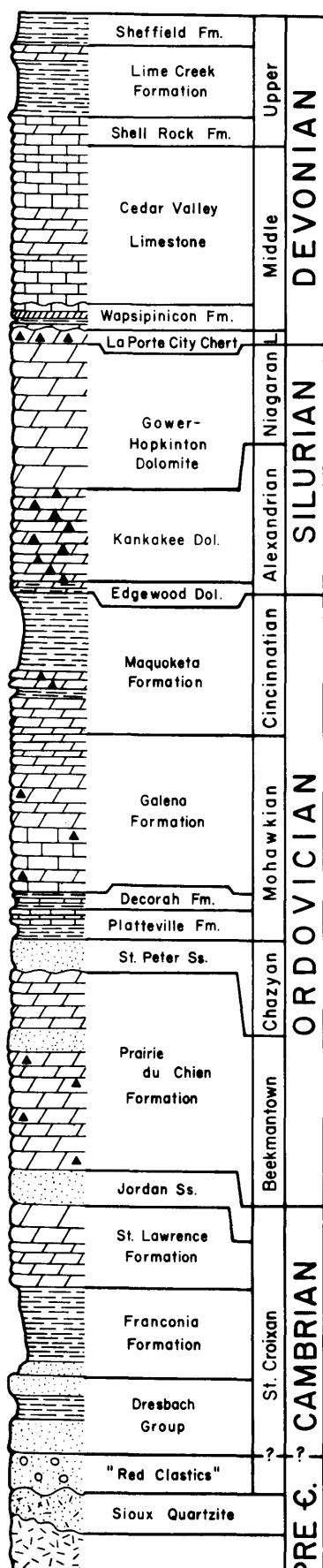
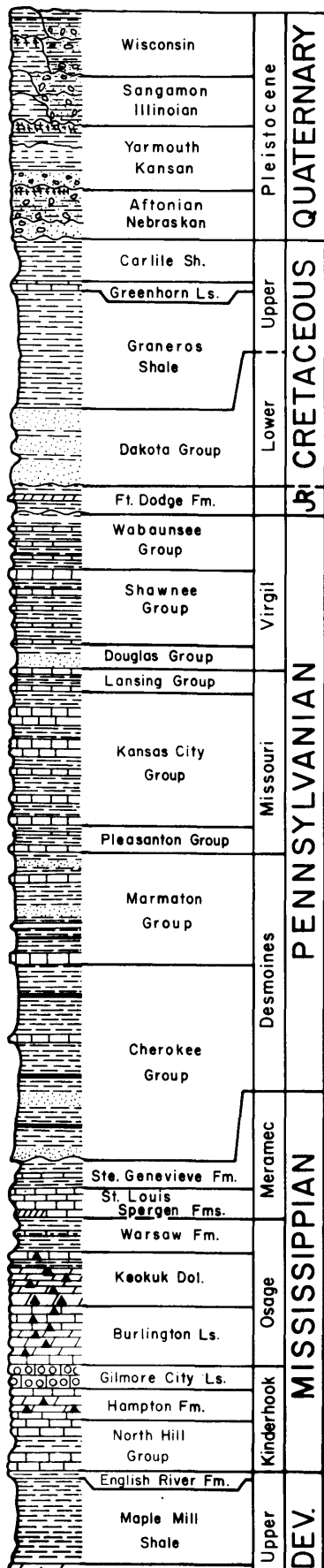
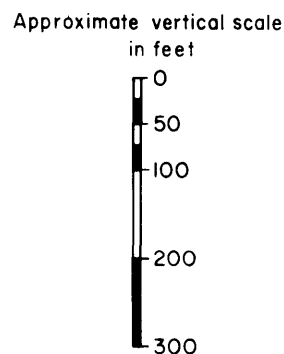


Figure 2



# GENERALIZED GEOLOGIC COLUMN FOR IOWA



## LEGEND

- Soil zone
- Till
- Shale (clay-silt in Pleistocene)
- Coal
- Sandstone (Sand in Pleistocene)
- Limestone
- Limestone, oolitic
- Dolomite
- Chert
- Gypsum
- Quartzite
- Metamorphic and igneous crystalline rocks

Figure 3  
IOWA GEOLOGICAL SURVEY

Wapsipinicon formation as well as the Niagaran dolomites of Silurian age. This outcrop pattern reflects the gentle southwesterly dip of the rock strata in Iowa, resulting in the characteristic pattern of younger on older formations, each extending along northwest-southeast trends. The Cedar River Valley is aligned with these bedrock trends, and at times its present channel coincides with deep bedrock channels (now filled with glacial debris) formed by an ancestral Cedar River in preglacial times.

#### E. Land Resources

The total land and water area of the Subbasin is 3,315,200 acres. The land use of the area is as follows:

| <u>Land Use</u> | <u>Acres</u> | <u>Percent</u> |
|-----------------|--------------|----------------|
| Cropland        | 2,652,840    | 80             |
| Pasture         | 237,530      | 7              |
| Forest          | 122,520      | 4              |
| Other           | 112,510      | 3              |
| Urban           | 186,960      | 6              |
| Federal         | 0            | 0              |
| Water           | 2,840        | *              |
|                 | 3,315,200    |                |

\* Less than 1 percent.

Of the total 3,125,400 acres of cropland, pasture, forest, and other uses, more than 92 percent, or 2,877,941 acres in Land Capability Classes I, II, and III are suitable for regular cultivation (Table 4 and Figure 4). Of this, 88 percent, or 2,540,667 acres, are being cultivated. Urban and Federal land and water areas are not included in the total.

About 240,600 acres of the land in Classes I, II, and III are in pasture and woodland. Much of this acreage would be available, if needed, for crop production, but much of it requires clearing, draining or other improvement to fit the land for cultivation. Some of this land is located in small or irregular areas which cannot be farmed efficiently with modern machinery. It would not be economically feasible in the foreseeable future to bring many of these small, irregularly shaped areas into cultivation. Operating farm units usually need a reasonable amount of pasture and woodlots, even on soils suitable for cultivation.

An area of about 466,885 acres is high quality Class I land with a minimum of problems as far as erosion, drainage, and continuing use are concerned. About 92 percent of this acreage is being cultivated. The 2,411,050 acres in land Classes II and III require moderate to intensive treatment for protection, improvement, and continuing production. About 87 percent of this acreage is being cultivated.

TABLE 4  
 LAND CAPABILITY CLASSES BY LAND USE 1/  
 FOR NON-URBAN LAND 2/  
 CEDAR RIVER SUBBASIN

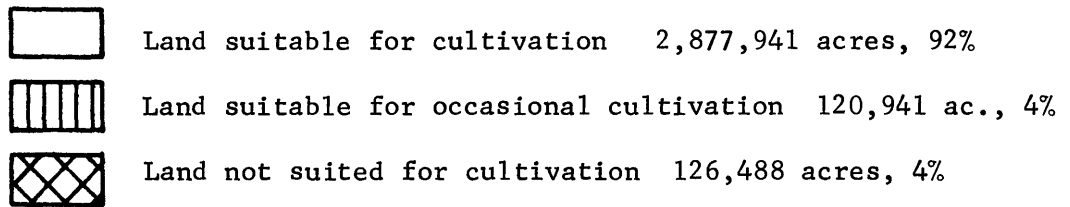
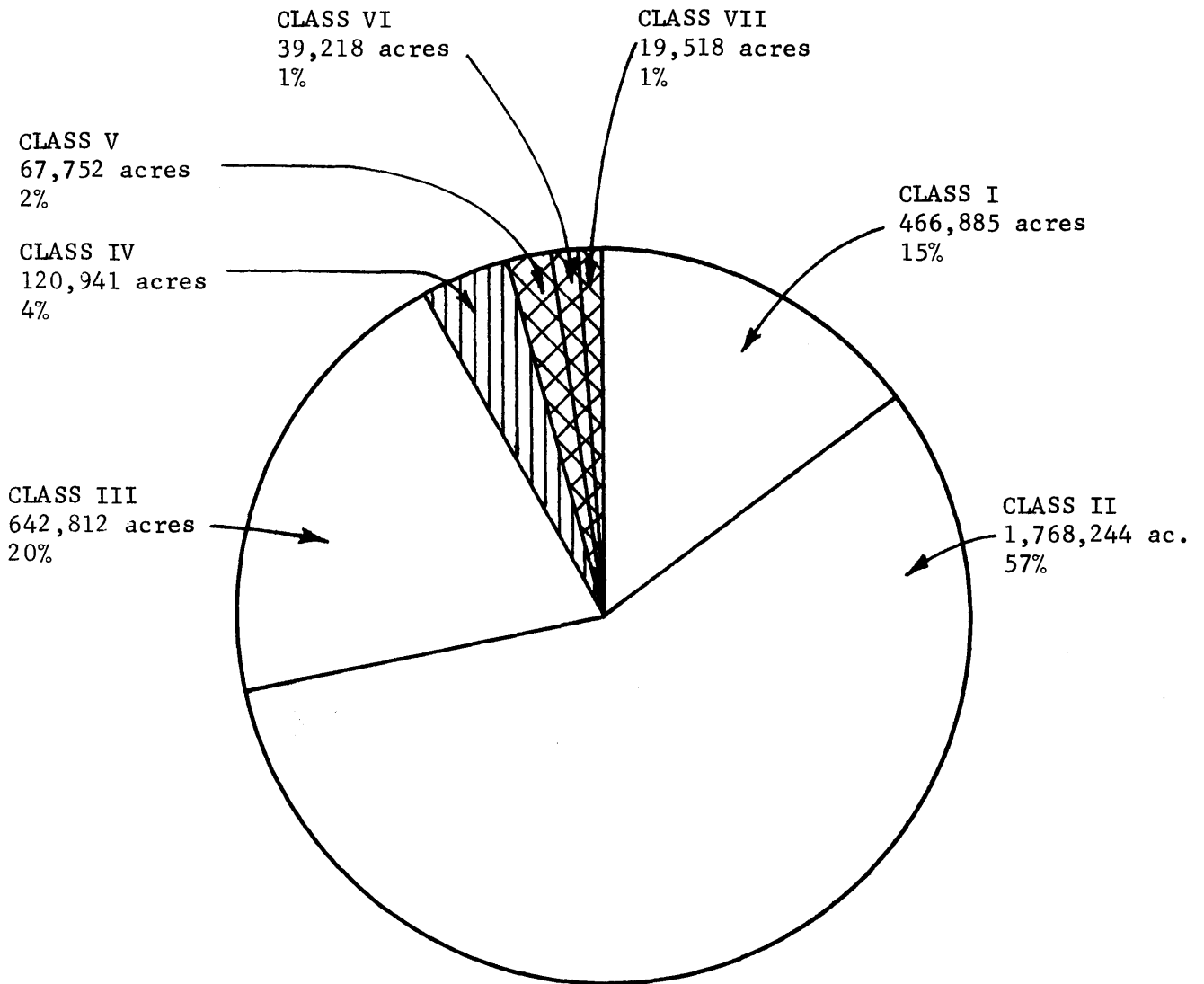
(Thousand Acres)

| Class                        | Cropland         | Pasture        | Forest         | Other          | Total            | Percent<br>Distribution |
|------------------------------|------------------|----------------|----------------|----------------|------------------|-------------------------|
| I                            | 431,516          | 13,375         | 3,556          | 18,438         | 466,885          | 14.9                    |
| II                           | 1,557,663        | 129,862        | 23,806         | 56,913         | 1,768,244        | 56.7                    |
| III                          | 551,488          | 49,435         | 20,567         | 21,322         | 642,812          | 20.6                    |
| Total I-III                  | <u>2,540,667</u> | <u>192,672</u> | <u>47,929</u>  | <u>96,673</u>  | <u>2,877,941</u> | <u>92.2</u>             |
| IV                           | 82,560           | 16,111         | 14,455         | 7,845          | 120,971          | 3.9                     |
| Total I-IV                   | <u>2,623,227</u> | <u>208,783</u> | <u>62,384</u>  | <u>104,518</u> | <u>2,998,912</u> | <u>96.1</u>             |
| V                            | 4,694            | 16,229         | 44,788         | 2,041          | 67,752           | 2.1                     |
| VI                           | 21,705           | 7,711          | 7,178          | 2,624          | 39,218           | 1.2                     |
| VII                          | 3,214            | 4,807          | 8,170          | 3,327          | 19,518           | 0.6                     |
| VIII                         | 0                | 0              | 0              | 0              | 0                | 0                       |
| Total V-VIII                 | <u>29,613</u>    | <u>28,747</u>  | <u>60,136</u>  | <u>7,992</u>   | <u>126,488</u>   | <u>3.9</u>              |
| TOTAL                        | <u>2,652,840</u> | <u>237,530</u> | <u>122,520</u> | <u>112,510</u> | <u>3,125,400</u> | <u>100.0</u>            |
| Percent of<br>Inventory Land | 84.9             | 7.6            | 3.9            | 3.6            | 100.0            | XX                      |

1/ Based on the hydrologic subareas of the Basin.

2/ Total geographic area 3,315,200 acres; total land area 3,312,360 acres; total water area 2840 acres.

Source: USDA Conservation Needs Inventory, 1967.



LAND CAPABILITY CLASSES

CEDAR RIVER SUBBASIN

Figure 4

About 120,971 acres of Class IV land is suitable for limited or occasional production with intensive conservation treatment. Much of it is considered marginal for the common cultivated crops but is suitable for other uses. Nearly 70 percent of this land is being cultivated.

About 29,613 acres being used as cropland are unsuited for cultivation. This land is in land capability Classes V, VI, and VII, with 73 percent of it in Class VI.

## F. Water Resources

### Surface Water

The average annual runoff varies from 5.6 inches in the north to 7.9 inches near the outlet with an overall average for the Subbasin of 7.2 inches. The surface water availability is described quantitatively in Table 5.

There are no major reservoirs installed in this Subbasin. The largest natural lake is Lake Geneva in Minnesota which covers about 1,800 acres.

### Groundwater

Precipitation falling on the surface and percolating into the soil and bedrock formations is the source of groundwater in the Cedar River basin. Most of the precipitation runs off in streams or is evaporated into the atmosphere again. Part of the water that soaks into the ground is withdrawn later by evaporation and by transpiration of plants. Only a relatively small portion of the precipitation seeps down to the water table and recharges the groundwater reservoir. Some water moves into and out of the Subbasin area by underflow through deep bedrock formations.

Recharge is determined by several factors including the amount of precipitation, the topography of the land surface, the amount and type of vegetation, the season, and the permeability of the surficial materials and bedrock. Most of the recharge occurs during the periods of heaviest precipitation in the spring and fall. Recharge seldom occurs during the growing season, except during floods, because plants take up most of the moisture, or during the winter when the ground is frozen.

The surficial and bedrock units of the Cedar River Subbasin are unconsolidated soil, loess, alluvium, and glacial drift clay, the latter two containing appreciable sand and gravel deposits, and indurated limestones, dolomites, shales, sandstones and siltstones. These materials have varying abilities to store and transmit water. The clays and shales are relatively impermeable and have low water-yielding capacities, while the more permeable alluvial, glacial and porous and creviced bedrock formations make good water-yielding strata.

Table 5 indicates the water resource availability for the Cedar River Subbasin.



TABLE 5

## WATER RESOURCE AVAILABILITY

Cedar River Subbasin  
Iowa-Cedar Rivers Basin

| Average <u>2/</u> Discharge : |      | Station Description                 | : Drainage Area : |                            | Flow Availability <u>1/</u> Percentage of Time Equaled or Exceeded |                            |       |                          |       |
|-------------------------------|------|-------------------------------------|-------------------|----------------------------|--|----------------------------|-------|--------------------------|-------|
| : cfs : inch/gr:              |      |                                     | : sq.mi. :        | : 50% Chance : cfs : csm : |  | : 95% Chance : cfs : csm : |       | : 99% Chance : cfs : csm |       |
| 173                           | 5.53 | Cedar River Near Austin, Minn.      | 425.              | 67                         | 0.158  | 42                         | 0.099 | 15                       | 0.035 |
| 139                           | 6.17 | Little Cedar River Near Ionia, Iowa | 306.              | 44                         | 0.144  | 10                         | 0.033 | 4                        | 0.013 |
| 744                           | 6.08 | Cedar River at Janesville           | 1661.             | 360                        | 0.217  | 107                        | 0.064 | 72                       | 0.043 |
| 174                           | 6.81 | Beaver Creek at New Hartford        | 347.              | 58                         | 0.167  | 8.4                        | 0.024 | 4.2                      | 0.012 |
| 146                           | 6.54 | Black Hawk Creek at Hudson          | 303.              | 51                         | 0.168  | 7.5                        | 0.025 | 2.8                      | 0.009 |
| 2625                          | 6.93 | Cedar River at Waterloo             | 5146.             | 1300                       | 0.253  | 380                        | 0.074 | 250                      | 0.049 |
| 3144                          | 6.56 | Cedar River at Cedar Rapids         | 6510.             | 1800                       | 0.277  | 490                        | 0.075 | 340                      | 0.052 |
| 4169                          | 7.27 | Cedar River Near Conesville         | 7785.             | 2410                       | 0.310  | 620                        | 0.080 | 421                      | 0.054 |

1/ From Iowa Natural Resources Council Bulletin No. 10.

2/ From Current Water Resource Data, U. S. Geological Survey.

The principal aquifers from which water is recovered by wells in the Subbasin are: (1) Shallow water-course sand and gravel deposits underlying the bottomlands and terrace levels of the Cedar River and its tributaries; (2) sand and gravel deposits within and at the base of the glacial drift including sand and gravel occupying deep bedrock channels such as in the lower reaches of the Subbasin in Linn, Cedar, and Muscatine Counties; (3) the upper bedrock aquifer consisting of limestone and dolomite strata of Devonian and Silurian age, and (4) the deeper-lying carbonate and sandstone formations of Ordovician and Cambrian age representing the Galena-Platteville, St. Peter, Prairie du Chien, and Jordan Formations.

The alluvium is not a major aquifer in the Cedar River Subbasin except locally as at Waterloo, Vinton, and Cedar Rapids. It supplies the bulk of the municipal supply of Cedar Rapids. This deposit generally is thin and is restricted to the valleys. Probably there are numerous farm wells on the bottomland areas pumping from alluvial sands on which data are not available. This aquifer may not be used as much as previously in the Subbasin because the deposits are thin and shallow wells are easily contaminated and subject to flood damage. Rock wells generally are thought to be more dependable sources. However, the potential of the alluvium may be very high in some places, especially in the southern half of the Subbasin.

Interglacial sands and bedrock channel sands are other sources of small to moderate water supplies to wells completed in unconsolidated materials in the Cedar River Subbasin. The interglacial sands are very irregular bodies and may be completely missing in some places. They may be quite productive where thick and extensive enough, or yield only minor supplies barely sufficient for farm wells. The bedrock surface of the Subbasin from the north line of Benton, Linn, and Buchanan Counties southward has been mapped on a contour interval of 50 feet. This mapping shows the bedrock surface to be highly dissected. The glacial debris filling the bedrock channels often contains thick sand and gravel deposits that may be capable of yielding appreciable water supplies to wells. Test drilling generally is necessary to verify this.

The Silurian-Devonian upper bedrock aquifer in the Cedar River Subbasin is one of the most productive water-bearing zones in the entire State yielding 1,000-3,500 + gpm in the Waterloo-Cedar Falls area and further upstream as far as Charles City. The carbonate formations appear to be extensively fractured and porous and the karstic surface favors recharge. Most domestic wells produce in the range of 10 to 40 gpm or so with small drawdowns while pumping. Numerous municipal wells, several of which are listed on the water quality sheets included here, also have their source in this aquifer. The water usually is of good quality although locally the aquifer may be polluted by downward leaching of surface materials. The dissolved solids concentration of the water increases on the western fringe of the Subbasin in Grundy and northwestern Tama County where evaporite deposits occur in the Devonian.

Table 6 gives a tabulation of water analysis for certain cities located in the Cedar River Subbasin.

TABLE 6  
 TABULATION OF WATER ANALYSIS  
 (Dissolved constituents in parts per million)

Sheet 1 of 4

| Town - Well No.<br>Owner                 | DATE OF<br>COLL. | DEPTH<br>(ft.) | Geol.<br>Source | °F | Diss.<br>Solids | Fe  | Mn | Ca | Mg | K   | Na  | CO <sub>3</sub> | HCO <sub>3</sub> | SO <sub>4</sub> | Cl  | F   | NO <sub>3</sub> | Hardness<br>cal as CaCC <sub>3</sub> |       |              | pH  | cond |      |
|--|------------------|----------------|-----------------|----|-----------------|-----|----|----|----|-----|-----|-----------------|------------------|-----------------|-----|-----|-----------------|--------------------------------------|-------|--------------|-----|------|------|
|  |                  |                |                 |    |                 |     |    |    |    |     |     |                 |                  |                 |     |     |                 | tot.                                 | carb. | non<br>carb. |     |      |      |
| Charles City<br>Municipal No.6<br>(1956) | 6/4/60           | 1355           | Jordan          |    | 255             | 1.1 | <  | 57 | 22 | 2.8 | 6.8 | 0               | 278              | 7.8             | 1   | 1.2 | 0.1             | <                                    | 232   | 228          | 4   | 7.5  | 450  |
| Waverly City<br>No. 2 (1930)             | 3/1/61           | 1253           | "               |    | 415             | 1.8 | <  | 66 | 27 | 10  | 40  | 0               | 356              | 72              | 3   | 2.3 | 0.1             | <                                    | 276   | 276          | 0   | 7.7  | 640  |
| Wellsburg Town<br>(1959)                 | 1/15/60          | 2050           | "               | 56 | 605             | .36 | <  | 83 | 34 | 22  | 72  | 2.4             | 378              | 168             | 11  | 1.1 | .44             |                                      | 347   | 314          | 33  | 8.1  | 920  |
| Dysart Town<br>No.2 (1944)               | 10/23/70         | 1805           | "               |    | 670             | 2.7 | <  | 96 | 46 | 15  | 68  | 0               | 386              | 270             | 7   | 1.0 | 0.2             |                                      | 430   | 316          | 114 | 7.2  | 1000 |
| Traer Town<br>No.3 (1964)                | 8/8/66           | 1813           | "               | 54 | 698             | 3.1 | <  | 96 | 44 | 14  | 61  | 0               | 397              | 242             | 8   | 1.1 | 0.5             |                                      | 420   | 326          | 94  | 7.5  | 1060 |
| Garrison Town<br>(1958)                  | 8/4/58           | 1618           | "               | 54 | 654             | .64 | <  | 87 | 42 | 21  | 63  | 0               | 361              | 224             | 9.0 | 1.0 | .44             |                                      | 391   | 296          | 95  | 7.5  | 940  |
| Vinton Town<br>No.2 (1932)               | 6/22/64          | 1505           | "               |    | 493             | 0.8 | <  | 75 | 37 | 13  | 70  | 0               | 356              | 195             | 6   | 1.1 | 12              |                                      | 340   | 292          | 48  | 7.6  | 890  |
| VanHorne Town<br>(1956)                  | 2/28/68          | 1870           | "               | 57 | 721             | 2.1 | <  | 88 | 44 | 16  | 120 | 0               | 364              | 340             | 9   | 1.2 | 0.4             |                                      | 400   | 298          | 102 | 7.3  | 1100 |
| Walker Town<br>No.2 (1965)               | 4/5/72           | 1525           | "               |    | 240             | .15 | <  | 54 | 23 | 2.0 | 8.7 | 0               | 281              | 28              | 0.5 | .35 | 0.4             |                                      | 256   | 230          | 26  | 7.1  | 450  |
| Marion Town<br>No.3 (1958)               | 3/25/71          | 1660           | "               | 54 | 400             | .44 | <  | 96 | 21 | 1.5 | 12  | 0               | 312              | 67              | 15  | .25 | 0.2             |                                      | 329   | 256          | 73  | 7.3  | 640  |
| Cedar Rapids<br>C.R.Gazette<br>(1940)    | 9/27/70          | 1495           | "               | 62 | 534             | .10 | <  | 96 | 32 | 7.2 | 39  | 0               | 351              | 160             | 20  | 0.5 | 11              |                                      | 372   | 288          | 84  | 7.5  | 830  |
| West Liberty<br>Town No.4<br>(1964)      | 3/27/72          | 1655           | "               |    | 1110            | .71 | <  | 76 | 36 | 17  | 240 | 0               | 290              | 490             | 100 | 1.6 | 0.6             |                                      | 348   | 238          | 110 | 7.2  | 1700 |

TABLE 6  
TABULATION OF WATER ANALYSIS  
(Dissolved constituents in parts per million)

Sheet 2 of 4

| Town - Well No.<br>Owner               | DATE OF<br>COLL. | Depth<br>(ft.) | Geol.<br>Source               | OF | Diss.<br>Solids | Fe  | Mn   | Ca  | Mg  | K   | Na  | CO <sub>3</sub> | HCO <sub>3</sub> | SO <sub>4</sub> | Cl | F   | NO <sub>3</sub> | Hardness<br>cal as CaCO <sub>3</sub> |       |              |     | Cond |     |
|--|------------------|----------------|-------------------------------|----|-----------------|-----|------|-----|-----|-----|-----|-----------------|------------------|-----------------|----|-----|-----------------|--------------------------------------|-------|--------------|-----|------|-----|
|  |                  |                |                               |    |                 |     |      |     |     |     |     |                 |                  |                 |    |     |                 | tot.                                 | carb. | non<br>carb. | PH  |      |     |
| Stacyville Town<br>(1915)              | 9/4/69           | 117            | Cedar<br>Valley<br>Fm.        |    | 312             | .12 | <    | 67  | 21  | 0.9 | 4.8 | 0               | 242              | 35              | 13 | 0.1 | 20              | 256                                  | 198   | 58           | 7.2 | 500  |     |
| St. Ansgar Town<br>No. 1 (1960)        | 10/11/71         | 240            | "                             |    | 384             | .04 | <    | 83  | 28  | 1.1 | 4.9 | 0               | 290              | 63              | 10 | 1.0 | 19              | 324                                  | 238   | 86           | 7.2 | 550  |     |
| Osage Town<br>No. 5 (1964)             | 2/27/69          | 650            | Cedar<br>Valley<br>Dec.-Platt |    | 282             | .24 | <    | 85  | 12  | 2.6 | 5.5 | 0               | 281              | 42              | 3  | 0.3 | 0.4             | 260                                  | 230   | 30           | 7.1 | 500  |     |
| Floyd Town<br>No.1 (1948)              | 2/14/72          | 193            | Cedar<br>Valley               | 54 | 289             | 1.3 | .04  | 78  | 17  | 1.2 | 4.4 | 0               | 268              | 37              | 5  | 0.3 | 0.2             | 260                                  | 220   | 40           | 6.9 | 490  |     |
| Charles City Mun-<br>icipal No.7(1963) | 3/23/70          | 186            | "                             | 50 | 249             | 1.4 | <    | 69  | 15  | 1.2 | 4.2 | 0               | 271              | 29              | 1  | 0.7 | 0.5             | 232                                  | 222   | 10           | 7.2 | 450  |     |
| Plainfield Town<br>No.1 (1959)         | 8/23/71          | 150            | " Wap-<br>sipini-<br>can      |    | 302             | .02 | <    | 70  | 12  | 1.2 | 8.6 | 0               | 229              | 37              | 12 | .15 | 14              | 224                                  | 188   | 36           | 7.0 | 480  |     |
| Waverly City<br>No. 5 (1967)           | 3/1/68           | 157            | CV-Wap-<br>Silurian           |    | 285             | .02 | <    | 78  | 18  | 1.3 | 6.9 | 0               | 276              | 21              | 10 | 0.2 | 14              | 268                                  | 226   | 42           | 7.5 | 520  |     |
| Janesville Town<br>No.2 (1959)         | 1/23/71          | 155            | "                             |    | 332             | .08 | <    | 75  | 17  | 1.0 | 5.0 | 0               | 249              | 29              | 8  | .15 | 28              | 256                                  | 204   | 52           | 7.3 | 500  |     |
| Grundy Center<br>No. 4 (1961)          | 12/7/70          | 530            | CV                            | 50 | 1060            | .80 | <    | 212 | 75  | 4.1 | 9.5 | 0               | 271              | 620             | 2  | 1.8 | 0.1             | 840                                  | 222   | 618          | 7.0 | 1400 |     |
| Dike Town<br>No. 2 (1906)              | 10/7/70          | 295            | "                             |    | 346             | 1.3 | <    | 70  | 25  | 2.0 | 18  | 0               | 312              | 77              | <  | 0.5 | .75             | 0.4                                  | 280   | 256          | 24  | 7.3  | 580 |
| Reinbeck Town<br>(East Well)           | 10/12/71         | 365            | "                             | 52 | 855             | .88 | .04  | 164 | 46  | 3.7 | 8.2 | 0               | 266              | 410             | 2  | 1.6 | 0.9             | 600                                  | 218   | 382          | 7.0 | 1100 |     |
| LaPorte City<br>Town No.3(1963)        | 4/6/71           | 280            |                               |    | 361             | .32 | <    | 75  | 27  | 5.4 | 19  | 0               | 320              | 76              | 2  | 1.2 | 0.4             | 300                                  | 262   | 38           | 7.0 | 610  |     |
| Evansdale Town<br>No.3 (1971)          | 6/30/71          | 305            |                               |    | 513             | .65 | <    | 95  | 35  | 5.2 | 34  | 0               | 366              | 79              | 44 | 0.8 | 0.5             | 383                                  | 300   | 83           | 7.0 | 820  |     |
| Lincoln Town                           | 4/4/71           | 512            |                               |    | 1670            | .82 | <.05 | 305 | 101 | 5.0 | 13  | 0               | 271              | 940             | 2  | 2.4 | 0.4             | 1180                                 | 222   | 858          | 7.1 | 1900 |     |

TABLE 6  
 TABULATION OF WATER ANALYSIS  
 (Dissolved constituents in parts per million)

Sheet 3 of 4

| Town - Well No.<br>Owner          | DATE OF<br>COLL. | Depth<br>(ft.) | Geol.<br>Source    | OF | Diss.<br>Solids | Fe  | Mn   | Ca  | Mg | K   | Na  | CO <sub>3</sub> | HCO <sub>3</sub> | SO <sub>4</sub> | Cl  | F   | Hardness<br>cal as CaCO <sub>3</sub> |      |       |              | pH  | Cond. |
|-----------------------------------|------------------|----------------|--------------------|----|-----------------|-----|------|-----|----|-----|-----|-----------------|------------------|-----------------|-----|-----|--------------------------------------|------|-------|--------------|-----|-------|
|                                   |                  |                |                    |    |                 |     |      |     |    |     |     |                 |                  |                 |     |     | NO <sub>3</sub>                      | TOT. | carb. | non<br>carb. |     |       |
| Jesup Town<br>No. 2 (1960)        | 4/1/68           | 380            | Silurian           | 44 | 335             | .40 | <.05 | 82  | 26 | 1.1 | 7.7 | 0               | 309              | 46              | 9   | 0.5 | 15                                   | 312  | 253   | 59           | 7.7 | 580   |
| Brandon Town<br>No.1(1955)        | 12/15/69         | 405            | "                  |    | 356             | .10 | <.05 | 78  | 27 | 4.1 | 19  | 0               | 382              | 36              | 1.5 | 0.8 | 5.8                                  | 308  | 308   | 0            | 7.1 | 640   |
| Urbana Town<br>No.2 (1959)        | 10/16/59         | 570            | Wapsi-<br>Silurian |    | 310             | .10 | <.05 | 49  | 24 | 4.3 | 28  | 0               | 317              | 228             | 2.0 | .75 | .44                                  | 221  | 221   | 0            | 7.8 | 530   |
| Newhall Town<br>No.2 (1957)       | 6/12/71          | 475            | "                  |    | 564             | 2.8 | <.05 | 81  | 37 | 11  | 57  | 0               | 393              | 190             | 0.5 | 1.2 | 0.4                                  | 356  | 322   | 34           | 7.1 | 940   |
| Alburnett Town<br>No.2 (1961)     | 4/9/70           | 400            | Silurian           |    | 327             | .28 | <.05 | 67  | 24 | 2.0 | 7.0 | 0               | 342              | 22              | 0.5 | 0.3 | 1.1                                  | 268  | 268   | 0            | 7.2 | 530   |
| C-R City Well<br>(Jones Pk)(1969) | 3/28/69          | 430            | "                  |    | 314             | 4.9 | <.05 | 80  | 28 | 2.7 | 14  | 0               | 354              | 43              | 2   | 0.3 | 0.2                                  | 315  | 290   | 25           | 7.3 | 560   |
| Marion Town<br>No. 2(1953)        | 3/25/71          | 440            | "                  | 53 | 319             | .36 | <.05 | 82  | 19 | 1.5 | 6.2 | 0               | 228              | 41              | 7   | 0.2 | 0.2                                  | 283  | 236   | 47           | 7.5 | 530   |
| Mt. Vernon Town<br>No.4 (1967)    | 12/31/70         | 400            | "                  |    | 323             | .46 | <.05 | 69  | 28 | 1.1 | 6.0 | 0               | 334              | 26              | 4   | 0.3 | <.01                                 | 288  | 274   | 14           | 7.2 | 530   |
| Tipton Town<br>No.6 (1966)        | 12/29/71         | 465            | "                  |    | 410             | .77 | .03  | 78  | 26 | 1.4 | 6.2 | 0               | 359              | 16              | 1   | .25 | 0.4                                  | 291  | 291   | 0            | 7.2 | 560   |
| West Branch Town<br>No.2 (1957)   | 12/21/71         | 428            | "                  |    | 469             | 2.1 | .12  | 110 | 32 | 2.6 | 15  | 0               | 420              | 68              | 19  | 0.2 | 0.2                                  | 400  | 344   | 56           | 7.0 | 760   |
| Mechanicsville<br>Town No.2(1962) | 9/25/68          | 455            | "                  | 54 | 259             | .56 | <.05 | 51  | 28 | 2.6 | 4.3 | 0               | 266              | 21              | 6   | .15 | 4.1                                  | 244  | 218   | 26           | 7.4 | 460   |
| Wilton Jct.<br>Town No.2(1968)    | 5/1/68           | 450            | "                  | 54 | 336             | 1.9 | .07  | 77  | 25 | 1.8 | 15  | 0               | 339              | 27              | 22  | 0.2 | 0.4                                  | 296  | 278   | 18           | 7.4 | 600   |

TABLE 6  
 TABULATION OF WATER ANALYSIS <sup>1/</sup>  
 (Dissolved constituents in parts per million)

Sheet 4 of 4

| Town - Well No.<br>Owner                          | DATE OF<br>COLL. | Depth<br>(ft.) | Geol.<br>Source               | °F | Diss.<br>Solids | Fe  | Mn  | Ca | Mg | K   | Na  | CO <sub>3</sub> | HCO <sub>3</sub> | SO <sub>4</sub> | Cl  | F   | NO <sub>3</sub> | tot. | Hardness<br>cal as CaCC <sub>3</sub> |             |     | Cond. |
|---|------------------|----------------|-------------------------------|----|-----------------|-----|-----|----|----|-----|-----|-----------------|------------------|-----------------|-----|-----|-----------------|------|--------------------------------------|-------------|-----|-------|
|   |                  |                |                               |    |                 |     |     |    |    |     |     |                 |                  |                 |     |     |                 |      | carb.                                | non<br>carb | pH  |       |
| Vinton Town<br>No. 3                              | 5/6/68           | 118            | Channel-<br>fill sd.<br>& gr. |    | 300             | 2.4 | .19 | 67 | 22 | 1.2 | 8.8 | 0               | 300              | 30              | 3   | 0.3 | 0.1             | 260  | 246                                  | 14          | 7.2 | 490   |
| Pulo Duane Arnold<br>Energy Center No.2<br>(1970) | 8/27/70          | 138            | "                             | 52 | 358             | .96 | .05 | 70 | 23 | 1.7 | 7.1 | 0               | 317              | 22              | 0.5 | .25 | 0.1             | 272  | 260                                  | 12          | 7.0 | 490   |
| Cedar Rapids<br>Municipal No.1<br>(West)(1964)    | 4/20/71          | 67             | Alluvial<br>sd&gr.            | 48 | 316             | .88 | 1.0 | 72 | 17 | 2.6 | 13  | 0               | 268              | 45              | 14  | .15 | 1.9             | 248  | 220                                  | 28          | 6.9 | 520   |
| Cedar Rapids<br>Municipal No.5<br>(East)          | 4/27/71          |                | "                             | 47 | 428             | 4.0 | .63 | 83 | 25 | 3.6 | 13  | 0               | 331              | 56              | 19  | .25 | 1.1             | 312  | 272                                  | 40          | 6.9 | 640   |
| Waterloo City<br>No. 12                           | 3/17/70          | 85             | "                             |    | 332             | .18 | .05 | 78 | 19 | 1.5 | 8.1 | 0               | 246              | 70              | 14  | 0.6 | 13              | 276  | 202                                  | 74          | 7.3 | 560   |

<sup>1/</sup> From Iowa Geological Survey

There probably will be some places over the Cedar River Subbasin where the upper bedrock aquifer will not yield large or even moderate supplies because the well bore failed to intersect a good crevice or solution opening. In this case, drilling may be continued into the deeper-lying Galena Formation, St. Peter Sandstone, or Prairie du Chien Dolomite-Jordan Sandstone sequence. The Galena has only limited use but might yield small to moderate supplies locally. The St. Peter generally will yield 50-100 gpm or so, while the Jordan is practically certain to yield upwards of several hundred gallons a minute and by developing the well extensively the production may be increased to 1,000 gpm or more. The Jordan Sandstone is rather poorly cemented in the northern part of the Subbasin and has a tendency to cave into wells causing sand pumping troubles. The water is of acceptable quality for drinking as shown on the accompanying mineral analyses summary sheet.

The Iowa Geological Survey in cooperation with the U.S. Geological Survey maintains a file of well logs and other hydrogeologic data on the Cedar River Subbasin. Computer printouts of well logs are available at a cost. Research on the hydrology of the aquifers underlying the basin is an integral part of this cooperative program.

#### G. Recreation and Fish and Wildlife Resources

Data provided by the Iowa State Conservation Commission and Minnesota agencies show that there are 183 recreation, wildlife, or water access areas in the Subbasin; 13 of these are state parks, recreation, or hunting and fishing areas.

Locally, the Lake McBride-Coralville Reservoir area is one of the main points of water based recreation such as fishing and boating. The Cedar River in Mitchell and Floyd Counties are designated canoe routes.

The southern part of the Cedar Subbasin has many species of wildlife. Those of high density are: Raccoon, opossum, striped skunk, badger, and pheasant. Those of moderate density are: Cottontail, quail, beaver, fox squirrel, red fox, ducks and geese. The species of low density are: Grey squirrel, mink, woodcock, muskrat and deer.

The north half of the Subbasin has high density populations of raccoon, opossum, striped skunk, and badger. Moderate density are made up of gray and fox squirrel, jack rabbit, mink, pheasant, beaver, waterfowl, red fox, and quail. Low density species are cottontail, woodcock, weasel, muskrat, deer, and quail.

The listing of all known public and private recreation facilities within the Subbasin is based upon a general statewide inventory maintained by the State Conservation Commission. The outdoor recreation area classification system developed by the Outdoor Recreation Resources Review Commission of 1962 is utilized where applicable.

General Outdoor Recreation Area  
Classification System

Class I. High-Density Recreation Areas

Generally located within or near urban centers, and "user-oriented" in design. Diverse and varied recreation opportunities, appropriate to the terrain and location and "mass" accommodations are provided. Intensive day or weekend type of activities.

Class II. General Outdoor Recreation Areas

The natural resource is utilized for the recreation opportunity it provides, irrespective of location. These areas are readily accessible, equipped with a wide variety of man-made facilities, and vary from the simple to the elaborate. Activities are generally of a localized nature and "mass" use is not generally a feature as in Class I.

Class III. Natural Environment Areas

Generally large areas which provide traditional outdoor recreation activities. The user is encouraged to use the area in its natural state with a minimum of man-made developments necessary for access and sanitation. Scattered use is more likely than concentrated use. The area may be used in conjunction with other resource uses.

Class IV. Unique-Natural Areas

These areas are unique in scenic splendor, natural wonder, and/or scientific importance. Recreation activities are strictly limited to those which will not affect the unique value of the natural features.

Class V. Primitive Areas

The essential characteristics of these areas are that the natural environment has not been disturbed by commercial utilization, and that mechanized transportation is non-existent. The natural, wild, and undeveloped characteristics are the distinguishing factors. The area must be sufficiently large to remove the user from the sights, sounds, and smells of civilization and provide the recreationist with a "feeling" of true wilderness experience.

Class VI. Historic and Cultural Sites

Sites associated with history, tradition, or cultural heritage and are of sufficient significance to merit preservation or restoration. Management is directed to restoration, preservation and interpretation for sightseeing, enjoyment, and study of the historic and cultural features. Limited day-use facilities may be provided when such facilities do not detract from nor interfere with the primary purpose and value of the site.



## Class VII. Reserved Open Spaces and Undeveloped Lands

Lands and waters in the classification are those desirable recreation sites which are acquired, pending eventual development, to preserve them from loss to conflicting or undesirable uses. They may be located anywhere such areas are found and acquired through several methods from easement agreement to fee simple title. When finally developed, such areas would be reclassified under the appropriate category.

### Wildlife Areas

Includes lands and waters specifically developed and managed for wildlife purposes. Areas in this class may be open to hunting or closed as in the case of refuges. In either situation the intent is for wildlife management. Other recreational facilities may be available, however, they are essentially provided to serve and facilitate the hunter.

### Water Access

This category includes those relatively small areas developed to essentially provide boating or fishing access to the waters of the State. Other recreational facilities may be available, but similar to wildlife areas their original intent is specific; in this situation boating or fishing access.

### Rest Areas

Highway oriented areas specifically developed to provide the highway traveller with a place for rest, relief, and relaxation from driving. They are relatively small and generally not intended for overnight use, or for use as destination recreation areas. They are incidental and serve to facilitate travel to other larger destination type recreation areas.

### Other

A general classification encompassing a variety of specific or specialized recreation endeavors. Areas in this category tend to be organization program or facility oriented rather than being dependent on any particular natural resource attribute. These include club areas, organizational areas, resorts, vacation farms, miniature golf, sports areas, race tracks, etc. This grouping includes any areas that cannot be classed in the other categories.

### General Recreation Area Listing

The General Recreation Area listing is based upon a recent (1968-1970) updating of the inventory of every known category of park and recreation land in the State. Details concerning the facilities available is summarized in Table 7 Recreation Inventory. This list provides general information as to the type of area, size, management, ownership, and services provided. Municipal recreation areas have not been listed. This listing is provided as a specific aid to local and regional planning efforts.

TABLE 7  
RECREATION INVENTORY  
Cedar River Subbasin  
Iowa-Cedar Rivers Basin

Sheet 1 of 14

| County     | Name                   | Location             | Ownership and Management |         |        |       |                | Recreation Classification or Specialization | Acreage |       |       | Camping |          |          | Vegetation Cabins | Picnick- ing |          | Shower | Shelters | Trails | Boat Access | Fishing | Hunting | Swimming | Other |                |
|------------|------------------------|----------------------|--------------------------|---------|--------|-------|----------------|---|---------|-------|-------|---------|----------|----------|-------------------|--------------|----------|--------|----------|--------|-------------|---------|---------|----------|-------|----------------|
|            |                        |                      | Fed.                     | St. Co. | Munic. | Priv. | Specialization |   | Land    | Water | Total | Mod.    | Non-Mod. | Un- dev. |                   | Dev.         | Un- dev. |        |          |        |             |         |         |          |       | Dev.           |
| Benton Co. | Dudgeon Lake           | 1 Mi. N. Vinton      |                          |         |        |       |                | Hunting A.                                  | 1,207   | 50    | 1,257 |         |          |          |                   |              |          |        |          |        | *           | *       | *       | *        |       |                |
|            | Minne Estma Park       | 3 1/2 Mi. NE Vinton  | 0                        | X       |        |       |                | II  | 60      |       | 60    | *       |          |          |                   | *            |          |        |          |        | *           | *       | *       | *        |       | Play Equipment |
|            | Benton City Fry Access | 5 Mi. E. Vinton      |                          |         |        |       |                | II  | 40      |       | 40    | *       |          |          |                   | *            |          |        |          |        | *           | *       | *       | *        |       | Play Equipment |
|            | Hoefle-Dulin Area      | 2 Mi. E. Vinton      |                          |         |        |       |                | II  | 61      |       | 61    | *       |          |          |                   | *            |          |        |          |        | *           | *       | *       | *        |       |                |
|            | Milroy Access          | 2 Mi. N. Vinton      |                          |         |        |       |                | River Access                                | 3       |       | 3     |         |          |          |                   | *            |          |        |          |        |             |         | *       |          |       |                |
|            | Mt. Auburn Bridge Area | 4 Mi. NE Mt. Auburn  |                          |         |        |       |                | VII   | 160     |       | 160   |         |          |          |                   |              |          |        |          |        |             |         |         |          |       |                |
|            | Wild Cat Bluff         | 2 Mi. S. Urbana      |                          |         |        |       |                | III   | 119     |       | 119   |         |          |          |                   |              |          |        |          |        | *           | *       | *       | *        |       |                |
|            | Jct. 218 & 8 Wayside   | 2 Mi. N. Jct 218 & 8 | 0                        |         |        |       | X              | Rest Area                                   |         |       |       | *       |          |          |                   | *            |          | *      |          |        |             |         |         |          |       |                |
|            | Benton Bow Benders     | Vinton               |                          |         |        |       |                | Arch-ery                                    | 3       |       | 3     |         |          |          |                   |              |          |        |          |        |             |         |         |          |       |                |
|            | Auto Race Track        | Vinton               |                          |         |        |       |                | Race Track                                  | 15      |       | 15    |         |          |          |                   |              |          |        |          |        |             |         |         |          |       |                |
|            | Warner Camping Area    | Vinton               |                          |         |        |       |                | I   | 2       |       | 2     | *       |          |          |                   |              |          |        |          |        |             |         |         |          |       |                |
|            | Urbana Legion Gun Club | Vinton               |                          |         |        |       |                | Shooting                                    | 3       |       | 3     |         |          |          |                   |              |          |        |          |        |             |         |         |          |       |                |
|            | Dulins Cedar R.C.G.    | Vinton               |                          |         |        |       |                | II  | 10      |       | 10    | *       |          |          |                   |              |          |        |          |        |             |         |         |          |       |                |
|            | Kiwanis Wayside        | Vinton               | 0                        |         |        |       | X              | Rest Area                                   | 4       |       | 4     |         |          |          |                   | *            |          |        |          |        |             |         |         |          |       |                |
|            | Vinton Bow Benders     | Vinton               |                          |         |        |       |                | Arch-ery                                    |         |       |       |         |          |          |                   |              |          |        |          |        |             |         |         |          |       |                |

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TABLE 7  
RECREATION INVENTORY  
Cedar River Subbasin  
Iowa-Cedar Rivers Basin

| County        | Name                          | Location                | Ownership and Management |     |     |        |       | Recreation Classification or Specialization | Acreage |       |       | Camping |          |          | Vacation Cabins | Picnick-ing |          | Modern Comfort Stations | Showers | Shelters | Trails | Boat Access | Roasting | Fishing    |            | Hunting | Swimming | Other |
|---------------|-------------------------------|-------------------------|--------------------------|-----|-----|--------|-------|---|---------|-------|-------|---------|----------|----------|-----------------|-------------|----------|-------------------------|---------|----------|--------|-------------|----------|------------|------------|---------|----------|-------|
|               |                               |                         | Fed.                     | St. | Co. | Munic. | Priv. |   | Land    | Water | Total | Mod.    | Non-Mod. | Un. dev. |                 | Dev.        | Un. dev. |                         |         |          |        |             |          | Cold Water | Warm Water |         |          |       |
| Black Hawk Co | YMCA                          | Waterloo                |                          |     |     |        | ☒     | Service Unknown                             |         |       |       |         |          |          |                 |             |          |                         |         |          |        |             |          |            |            |         |          |       |
|               | YWCA                          | Waterloo                |                          |     |     |        | ☒     | Service Unknown                             |         |       |       |         |          |          |                 |             |          |                         |         |          |        |             |          |            |            |         |          |       |
|               | Airline Golf Range            | Waterloo                |                          |     |     |        | ☒     |   | 20      |       | 20    |         |          |          |                 |             |          |                         |         |          |        |             |          |            |            |         |          |       |
|               | Archery Range                 | Waterloo                |                          |     |     |        | ☒     | Service Unknown                             |         |       |       |         |          |          |                 |             |          |                         |         |          |        |             |          |            |            |         |          |       |
|               | Black Hawk Stables            | Cedar Falls             |                          |     |     |        | ☒     |   | 20      |       | 20    | *       |          | *        |                 |             |          |                         |         |          |        |             |          | *          |            |         |          |       |
|               | Cedar Falls Amusement         | Cedar Falls             |                          |     |     |        | ☒     | Service Unknown                             |         |       |       |         |          |          |                 |             |          |                         |         |          |        |             |          |            |            |         |          |       |
|               | Washington Union Park         | 6 Mi. N.W. Cedar Falls  |                          |     |     | ☒      |       | VII   | 185     | 5     | 190   |         |          |          |                 |             |          |                         |         |          |        |             |          | *          | *          |         |          |       |
|               | Indian Hills Access           | 2½ Mi. E. La Porte City | 0                        |     | X   |        |       | III   | 138     |       | 138   | *       |          | *        | *               |             | *        |                         | *       |          |        |             |          | *          | *          |         |          |       |
|               | Perry Canfield Park           | Cedar Falls             |                          |     |     | ☒      |       | III   | 40      |       | 40    |         |          |          |                 |             | *        |                         |         |          |        |             |          | *          |            |         |          |       |
|               | Popp Access                   | 1 Mi. SW Hudson         |                          |     |     | ☒      |       | River Access                                | 67      | 2     | 69    |         |          |          |                 |             | *        |                         |         |          |        |             |          | *          | *          |         |          |       |
|               | Sargent Memorial Hwy. Wayside | 1 Mi. N.E. Hudson       |                          |     |     | ☒      |       | Rest Area                                   | 4       |       | 4     | *       |          | *        |                 |             | *        |                         |         |          |        |             |          | *          | *          |         |          |       |
|               | Seyfer Access                 | 6 Mi. S. W. Hudson      |                          |     |     | ☒      |       | River Access                                | 4       |       | 4     |         |          |          |                 |             |          |                         |         |          |        |             |          | *          | *          |         |          |       |
|               | Cedar Falls Boat Club         | Cedar Falls             |                          |     |     |        | ☒     | Service Unknown                             |         |       |       |         |          |          |                 |             |          |                         |         |          |        |             |          |            |            |         |          |       |
| Electric Park | Waterloo                      |                         |                          |     |     | ☒      |       | 5   |         | 5     |       |         |          |          |                 |             |          |                         |         |          |        |             |          |            |            |         |          |       |

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TABLE 7  
RECREATION INVENTORY  
Cedar River Subbasin  
Iowa-Cedar Rivers Basin

| County                    | Name                     | Location                  | Ownership and Management |     |     |        |       | Recreation Classification or Specialisation | Acreage |       |       | Camping |          |         | Picnicking | Modern Sport Facilities | Shower | Shelters | Trails | Boat Access | Boating | Fishing |            | Hunting | Swimming       | Other |
|---------------------------|--------------------------|---------------------------|--------------------------|-----|-----|--------|-------|---|---------|-------|-------|---------|----------|---------|------------|-------------------------|--------|----------|--------|-------------|---------|---------|------------|---------|----------------|-------|
|                           |                          |                           | Fed.                     | St. | Co. | Munic. | Priv. |   | Land    | Water | Total | Mod.    | Non-Mod. | Un-dev. |            |                         |        |          |        |             |         | Un-dev. | Cold Water |         |                |       |
| Black Hawk Co             | Hillcrest Farm           | Cedar Falls               |                          |     |     |        | ☒     |   | 10      |       | 10    |         |          |         |            |                         |        |          |        |             |         |         |            |         | Riding         |       |
|                           | Iowa State Trapshooting  | Cedar Falls               |                          |     |     |        | ☒     |   | 40      |       | 40    |         |          |         | *          |                         |        |          |        |             |         |         |            |         | Trapshooting   |       |
|                           | Olsen Boat House         | Cedar Falls               |                          |     |     |        | ☒     | Service Unknown                             |         |       |       |         |          |         |            |                         |        |          |        |             |         |         |            |         |                |       |
|                           | Raceway                  | Waterloo                  |                          |     |     |        | ☒     |   | 5       |       | 5     |         |          |         |            |                         |        |          |        |             |         |         |            |         | Go-Kart Racing |       |
|                           | Spring Valley Trout Farm | La Porte City             |                          |     |     |        | ☒     |   | 9       | 1     | 10    |         |          |         | *          |                         |        |          |        |             |         | *       |            |         |                |       |
|                           | United Sportsmen         | Waterloo                  |                          |     |     |        | ☒     | Service Unknown                             |         |       |       |         |          |         |            |                         |        |          |        |             |         |         |            |         |                |       |
|                           | Villa Golf               | Waterloo                  |                          |     |     |        | ☒     |   | 1       |       | 1     |         |          |         |            |                         |        |          |        |             |         |         |            |         | Practice Golf  |       |
|                           | Waterloo Archery Range   | Waterloo                  |                          |     |     |        | ☒     | Service Unknown                             |         |       |       |         |          |         |            |                         |        |          |        |             |         |         |            |         |                |       |
|                           | Waterloo Boat Club       | Waterloo                  |                          |     |     |        | ☒     | Service Unknown                             |         |       |       |         |          |         |            |                         |        |          |        |             |         |         |            |         |                |       |
|                           | Neita Raceway            | Waterloo                  |                          |     |     |        | ☒     | Go-Kart                                     | 5       |       | 5     |         |          |         |            |                         |        |          |        |             |         |         |            |         |                |       |
|                           | George Wyth State Park   | Hwy. 20 E. of Cedar Falls |                          | ☒   |     |        |       | III   | 419     |       | 419   | *       |          |         | *          | *                       | *      | *        | *      | *           | *       | *       | *          | *       |                |       |
|                           | Falls Access             | 2 Mi. N.W. Cedar Falls    |                          | ☒   |     |        |       | River Access                                | 254     | 15    | 269   | *       |          |         | *          |                         |        |          | *      | *           | *       | *       | *          | *       |                |       |
|                           | Cedar R. Access          | 2 Mi. E. La Porte City    |                          |     | ☒   |        |       | River Access                                | 27      |       | 27    | *       |          |         | *          |                         |        |          | *      | *           | *       | *       | *          | *       |                |       |
| Black Hawk Cr. Green Belt | 3 Mi. N.E. Hudson        |                           |                          | ☒   |     |        | VII   | 349   | 2       | 351   |       |         |          |         |            |                         |        |          |        |             |         |         |            |         |                |       |

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TABLE 7  
RECREATION INVENTORY  
Cedar River Subbasin  
Iowa-Cedar Rivers Basin

| County                | Name                     | Location                | Ownership and Management |     |     |        |       | Recreation Classification or Specialization | Acreage         |       |       | Camping |          |          | Vacation Cabins | Picnick-ing |         | Modern Comfort SECTION | Showers | Shelters | Trails | Boat Access | Fishing | Cold Water | Warm Water | Hunting | Swimming                                      | Other |
|-----------------------|--------------------------|-------------------------|--------------------------|-----|-----|--------|-------|---|-----------------|-------|-------|---------|----------|----------|-----------------|-------------|---------|------------------------|---------|----------|--------|-------------|---------|------------|------------|---------|---|-------|
|                       |                          |                         | Fed.                     | St. | Co. | Munic. | Priv. |   | Land            | Water | Total | Mod.    | Non-Mod. | Un. dev. |                 | Dev.        | Un-Dev. |                        |         |          |        |             |         |            |            |         |   |       |
| Black Hawk Co.        | Black Hawk Park          | 2½ Mi. N.W. Cedar Falls |                          |     |     | ☒      |       | III   | 1,083           | 10    | 1,093 | *       |          |          | *               | *           |         |                        | *       | *        | *      | *           |         |            | *          |         | Nature Study, Riding Trails, Handicapped Fac. |       |
|                       | Casebeer Heights Access  | ½ Mi. S.E. Evansdale    |                          |     |     | ☒      |       | River Access                                | 20              |       | 20    |         |          |          |                 |             |         |                        |         |          | *      | *           | *       |            |            |         |   |       |
|                       | Elk Run Park             | S. Edge of Evansdale    |                          |     |     | ☒      |       | II  | 26              |       | 26    |         |          |          | *               |             |         |                        |         |          |        |             |         |            |            |         | Sports Fields                                 |       |
|                       | Gilbertville Park        | S. Edge Gilbertville    |                          |     |     | ☒      |       | II  | 5               |       | 5     | *       |          |          | *               |             |         |                        |         |          |        | *           | *       | *          |            |         |   |       |
|                       | Hickory Hills Park       | 7 Mi. N. Dysart         |                          |     |     | ☒      |       | III   | 418             | 72    | 490   | *       |          |          | *               |             |         |                        |         |          | *      | *           | *       | *          | *          | *       | Sports Fields                                 |       |
|                       | Hwy. #63 Wayside         | 3/4 Mi. NE Hudson       | 0                        | X   |     |        |       |   | Rest Area       | 2     |       | 2       |          |          |                 | *           |         |                        |         |          |        |             |         |            |            |         |   |       |
| Bremer Co.            | Waverly Boat Club        | Waverly                 |                          |     |     |        | ☒     |   |                 |       |       |         |          |          |                 |             |         |                        |         |          | *      | *           |         |            |            |         |   |       |
|                       | Waverly Go-Cart          | Waverly                 |                          |     |     |        | ☒     |   | 4               |       | 4     |         |          |          |                 |             |         |                        |         |          |        |             |         |            |            |         | Go-Kart Track                                 |       |
|                       | Brandt Park              | Denver                  |                          |     |     | ☒      |       | River Access                                | 9               | 1     | 10    | *       |          |          | *               |             |         |                        |         |          |        |             | *       |            |            |         |   |       |
|                       | Cedar Bend Park          | 1½ Mi. N.W. Waverly     |                          |     |     | ☒      |       | II  | 184             |       | 184   | *       |          |          | *               |             |         |                        |         | *        |        |             | *       |            |            |         |   |       |
|                       | Washington Twp. Way-Side | 2 Mi. N. Waverly        | 0                        |     |     |        | X     |   | Rest Area       | 1     |       | 1       |          |          |                 | *           |         |                        |         |          |        |             |         |            |            |         |   |       |
|                       | Anderson Park            | Janesville              |                          |     |     |        | ☒     |   |                 | 14    |       | 14      | *        |          |                 | *           |         |                        |         |          |        |             | *       |            |            |         | Playground                                    |       |
|                       | Camp Inga-Wanis          | Waverly                 |                          |     |     |        | ☒     |   | Service Unknown |       |       |         |          |          |                 |             |         |                        |         |          |        |             |         |            |            |         |   |       |
| Frank Clewell Boating | Waverly                  |                         |                          |     |     | ☒      |       |   |                 |       |       |         |          |          |                 |             |         |                        |         |          | *      | *           |         |            |            |         |   |       |

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TABLE 7  
RECREATION INVENTORY  
Cedar River Subbasin  
Iowa-Cedar Rivers Basin

| County        | Name                        | Location                    | Ownership and Management |     |     |        | Recreation Classification or Specialization | Acreage         |      |       | Camping |      |          | Vacation Cabins | Picnick-ing |      | Modern Comfort Facilities | Showers | Shelters | Trails | Boat Access | Roasting | Fishing |            | Hunting | Swimming         | Other |            |
|---------------|-----------------------------|-----------------------------|--------------------------|-----|-----|--------|---|-----------------|------|-------|---------|------|----------|-----------------|-------------|------|---------------------------|---------|----------|--------|-------------|----------|---------|------------|---------|------------------|-------|------------|
|               |                             |                             | Fed.                     | St. | Co. | Munic. |   | Priv.           | Land | Water | Total   | Mod. | Non-Mod. |                 | Un-dev.     | Dev. |                           |         |          |        |             |          | Un-dev. | Cold Water |         |                  |       | Warm Water |
|               |                             |                             |                          |     |     |        |   |                 |      |       |         |      |          |                 |             |      |                           |         |          |        |             |          |         |            |         |                  |       |            |
| Bremer Co.    | St. Pauls Lutheran School   | Waverly                     |                          |     |     |        | ☒   | Service Unknown |      |       |         |      |          |                 |             |      |                           |         |          |        |             |          |         |            |         |                  |       |            |
|               | Janesville Wayside          | W. Edge of Janesville       |                          | 0   |     |        | X   | RestArea        | 1    |       | 1       |      |          |                 | *           |      |                           |         |          |        |             |          |         |            |         |                  |       |            |
|               | U.S. Hwy #63 Wayside        | 4 Mi. N. Intersec. 3-63     |                          |     |     |        | ☒   | Undev. RestArea | 1    |       | 1       |      |          |                 |             |      |                           |         |          |        |             |          |         |            |         |                  |       |            |
| Buchanan Co.  | Lime Cr. Area               | 1 Mi. N.E. Brandon          |                          |     |     |        | ☒   | River Access    | 38   | 1     | 39      |      | *        |                 | *           |      |                           |         |          |        |             |          |         | *          | *       | Handicapped Fac. |       |            |
| Butler Co.    | Kramer Farm                 | Parkersburg                 |                          |     |     |        | ☒   |                 | 148  |       | 148     |      |          |                 |             |      |                           |         |          |        |             |          |         |            |         |                  |       |            |
|               | Beaver Meadows Park         | N. Edge of Parkersburg      |                          |     |     |        | ☒   | VII             | 30   | 2     | 32      |      |          |                 |             |      |                           |         |          |        |             |          |         |            |         |                  |       |            |
|               | Moore Rec. Area             | 2 Mi. N.W. Hartford         |                          |     |     |        | ☒   | VII             | 35   |       | 35      |      |          |                 |             |      |                           |         |          |        |             |          |         |            |         |                  |       |            |
| Cedar Co.     | Koch's Lake                 | Tipton                      |                          |     |     |        | ☒   | I               | 25   |       | 25      | *    |          |                 |             | *    |                           |         |          |        |             |          |         |            |         |                  |       |            |
|               | Cedar Lakes                 | Tipton                      |                          |     |     |        | ☒   | II              | 10   |       | 10      | *    |          |                 |             | *    |                           |         |          |        |             |          |         |            |         |                  |       |            |
| Muscatine Co. | Country Tiara               | West Liberty                |                          |     |     |        | ☒   | Service Unknown |      |       |         |      |          |                 |             |      |                           |         |          |        |             |          |         |            |         |                  |       |            |
| Cedar Co.     | Herbert Hoover Nat. H. Site | West Branch                 | ☒                        |     |     |        |   | VI              | 200  |       | 200     |      |          | *               | *           |      | *                         |         |          |        |             |          |         |            |         | Historic         |       |            |
|               | I-80 Way-side               | 2 Mi. E. Tipton Interchange |                          | ☒   |     |        |   | RestArea        | 10   |       | 10      |      |          | *               | *           |      | *                         |         |          |        |             |          |         |            |         |                  |       |            |
|               | Bennett Park                | 2 Mi. E. Bennett            |                          |     |     |        | ☒   | VII             | 65   | 10    | 75      |      |          |                 |             |      |                           |         |          |        |             |          |         |            |         |                  |       |            |
|               | Cedar Valley Green Belt     | 5 Mi. N. Springdale         |                          |     |     |        | ☒   | III             | 227  |       | 227     |      |          |                 |             |      |                           |         |          | *      | *           |          | *       |            |         |                  |       |            |

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TABLE 7  
RECREATION INVENTORY  
Cedar River Subbasin  
Iowa-Cedar Rivers Basin

| County        | Name                     | Location                 | Ownership and Management |     |     |        |       | Recreation<br>Classification<br>or<br>Specialization | Acreage |       |       | Camping |              |             | Vacation<br>Cabins | Picnick-<br>ing |             | Modern<br>Comfort<br>Station | Showers | Shelters | Trails | Roast<br>Access | Boating | Fishing       |               | Hunting | Swimming         | Other |
|---------------|--------------------------|--------------------------|--------------------------|-----|-----|--------|-------|--|---------|-------|-------|---------|--------------|-------------|--------------------|-----------------|-------------|------------------------------|---------|----------|--------|-----------------|---------|---------------|---------------|---------|------------------|-------|
|               |                          |                          | Fed.                     | St. | Co. | Munic. | Priv. |  | Land    | Water | Total | Mod.    | Non-<br>Mod. | Un.<br>dev. |                    | Dev.            | In-<br>dev. |                              |         |          |        |                 |         | Cold<br>Water | Warm<br>Water |         |                  |       |
|               |                          |                          |                          |     |     |        |       |  |         |       |       |         |              |             |                    |                 |             |                              |         |          |        |                 |         |               |               |         |                  |       |
| Cedar Co.     | Red Oak Park             | 5½ Mi. N.W. Tipton       |                          |     |     | ☑      |       | II   | 7       |       | 7     |         |              |             | *                  |                 |             |                              |         |          |        |                 |         |               | *             |         |                  |       |
|               | Rochester Area           | 8 Mi. S.W. Tipton        |                          |     |     | ☑      |       | River Access   | 3       |       | 3     |         |              |             | *                  |                 |             |                              |         |          |        | *               | *       |               | *             |         |                  |       |
| Chickasaw Co. | Chickasaw Mill           | 2 Mi. W. Ionia           |                          | 0   |     | X      |       | II   | 14      | 2     | 16    |         | *            |             | *                  |                 |             |                              |         |          |        |                 |         |               | *             | *       | Handicapped Fac. |       |
|               | Little Brown Ch. Wayside | 1½ Mi. E. Nashua         |                          | 0   |     |        | X     | RestArea   |         |       |       |         |              |             | *                  |                 |             |                              |         |          |        |                 |         |               |               |         |                  |       |
|               | Nashua Archery Club      | Nashua                   |                          |     |     |        | ☑     | Service Unknown                                      |         |       |       |         |              |             |                    |                 |             |                              |         |          |        |                 |         |               |               |         |                  |       |
|               | Nashua Fish & Game       |                          |                          |     |     |        | ☑     |  | 30      |       | 30    |         |              |             |                    |                 |             |                              |         |          |        |                 |         |               |               |         |                  |       |
|               | Nashua Water Hawks       |                          |                          |     |     |        | ☑     | River Access   |         |       |       |         |              |             |                    |                 |             |                              |         |          |        |                 |         |               |               |         |                  |       |
| Floyd Co.     | Idlewild Area            | 10 Mi. N.W. Charles City |                          | 0   |     | ☑      |       | Wildlife Area  | 130     | 6     | 136   |         | *            |             |                    |                 |             |                              |         |          | *      | *               |         | *             | *             |         |                  |       |
|               | Rotary Park              | 4 Mi. S.E. Floyd         |                          |     |     | ☑      |       | VII  | 15      | 2     | 17    |         |              |             |                    |                 |             |                              |         |          |        |                 |         |               |               |         |                  |       |
|               | Howard Woods             | 2 Mi. N.W. Nashua        |                          |     |     | ☑      |       | II   | 18      | 2     | 20    |         | *            |             | *                  |                 |             |                              |         |          | *      | *               |         | *             |               |         | Handicapped Fac. |       |
|               | Hwy. 218 Wayside         | 7 Mi. S. Charles City    |                          | 0   |     | X      |       | RestArea   | 2       |       | 2     |         |              |             | *                  |                 |             |                              |         | *        |        |                 |         |               |               |         |                  |       |
|               | Meyer Forest             | 5½ Mi. N.W. Charles City |                          |     |     | ☑      |       | VII  | 102     |       | 102   |         |              |             |                    |                 |             |                              |         |          |        |                 |         |               |               |         |                  |       |
|               | Bunn's Woods             | 7 Mi. S.E. Charles City  |                          |     |     | ☑      |       | VII  | 38      |       | 38    |         |              |             |                    |                 |             |                              |         |          |        |                 |         |               |               |         |                  |       |

0 - Ownership  
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TABLE 7  
RECREATION INVENTORY  
Cedar River Subbasin  
Iowa Cedar Rivers Basin

| County       | Name                                | Location           | Ownership and Management |     |     |        |       | Recreation Classification or Specialization | Acreage           |       |       | Camping |          |          | Vacation Cabins | Picnick-ing |          | Modern Comfort Station | Showers | Shelters | Trails | Boat Access | Boating | Fishing    |            | Hunting | Swimming | Other |  |  |  |  |  |   |  |   |  |  |
|--------------|-------------------------------------|--------------------|--------------------------|-----|-----|--------|-------|---|-------------------|-------|-------|---------|----------|----------|-----------------|-------------|----------|------------------------|---------|----------|--------|-------------|---------|------------|------------|---------|----------|-------|--|--|--|--|--|---|--|---|--|--|
|              |                                     |                    | Fed.                     | St. | Co. | Munic. | Priv. |   | Land              | Water | Total | Mod.    | Non-Mod. | Un. dev. |                 | Dev.        | Un. dev. |                        |         |          |        |             |         | Cold Water | Warm Water |         |          |       |  |  |  |  |  |   |  |   |  |  |
|              |                                     |                    |                          |     |     |        |       |   |                   |       |       |         |          |          |                 |             |          |                        |         |          |        |             |         |            |            |         |          |       |  |  |  |  |  |   |  |   |  |  |
| Floyd Co.    | River Dock                          | Charles City       |                          |     |     | X      |       |   |                   | 1     |       | 1       |          |          |                 |             |          |                        |         |          |        |             |         |            |            |         |          |       |  |  |  |  |  |   |  |   |  |  |
|              | Colwell Park                        | 2½ Mi. W. Colwell  |                          |     |     | X      |       |   | II                | 18    | 1     | 19      | *        |          |                 | *           |          |                        |         |          |        |             |         |            |            | *       |          |       |  |  |  |  |  | * |  |   |  |  |
|              | County Museum                       | Charles City       |                          |     |     | X      |       |   | VI                | 1     |       | 1       |          |          |                 |             |          |                        |         |          |        |             |         |            |            |         |          |       |  |  |  |  |  |   |  |   |  |  |
|              | Flora Ellis Wildlife Sanc.          | Charles City       |                          |     |     | X      |       |   | Wildlife Area     | 10    |       | 10      |          |          |                 |             |          |                        |         |          |        |             |         |            |            | *       |          |       |  |  |  |  |  |   |  |   |  |  |
|              | Floyd Park                          | Floyd              |                          |     |     | X      |       |   | RestArea          | 4     |       | 4       | *        |          |                 | *           |          |                        |         | *        |        |             |         |            |            |         |          |       |  |  |  |  |  |   |  | * |  |  |
|              | YMCA Camp Christy                   | Charles City       |                          |     |     |        |       | X   | Service Unknown   |       |       |         |          |          |                 |             |          |                        |         |          |        |             |         |            |            |         |          |       |  |  |  |  |  |   |  |   |  |  |
|              | La Bounty Driving Range & Min. Golf | Charles City       |                          |     |     |        |       | X   | Min. Golf         |       |       |         |          |          |                 |             |          |                        |         |          |        |             |         |            |            |         |          |       |  |  |  |  |  |   |  |   |  |  |
|              | Charles City Archery Club           | Charles City       |                          |     |     |        |       | X   | Service Unknown   |       |       |         |          |          |                 |             |          |                        |         |          |        |             |         |            |            |         |          |       |  |  |  |  |  |   |  |   |  |  |
| Franklin Co. | Quad Co. Cons. League               | Ackley             |                          |     |     |        |       | X   | Service Unknown   |       |       |         |          |          |                 |             |          |                        |         |          |        |             |         |            |            |         |          |       |  |  |  |  |  |   |  |   |  |  |
|              | Church Camp                         | Ackley             |                          |     |     |        |       | X   | Service Unknown   |       |       |         |          |          |                 |             |          |                        |         |          |        |             |         |            |            |         |          |       |  |  |  |  |  |   |  |   |  |  |
|              | Blakes Grove Camp                   | Ackley             |                          |     |     |        |       | X   | Service Unknown   |       |       |         |          |          |                 |             |          |                        |         |          |        |             |         |            |            |         |          |       |  |  |  |  |  |   |  |   |  |  |
| Grundy       | Beaman Arboretum                    | Beaman             |                          |     |     | X      |       |   | Outdoor Classroom | 5     |       | 5       |          |          |                 | *           |          |                        |         |          |        |             |         |            |            |         |          |       |  |  |  |  |  |   |  |   |  |  |
|              | Beaver Arboretum                    | Jct. Hwys. 14 & 57 |                          |     |     | X      |       |   | Outdoor Classroom | 1     |       | 1       |          |          |                 | *           |          |                        |         |          |        |             |         |            |            |         |          |       |  |  |  |  |  |   |  |   |  |  |

0 - Ownership  
X - Management  
■ - Ownership and Management



RECREATION INVENTORY  
Cedar River Subbasin  
Iowa-Cedar Rivers Basin

Sheet 8 of 14

| County                 | Name                        | Location                | Ownership and Management |     |     |        |       | Recreation Classification or Specialization | Acreage         |       |       | Camping |          |         | Vacation Cabins | Picnick-ing |         | Modern Comfort Station | Showers | Shelters | Trellis | Roat Access | Boating | Fishing    |            | Hunting    | Swimming   | Other          |  |
|------------------------|-----------------------------|-------------------------|--------------------------|-----|-----|--------|-------|---|-----------------|-------|-------|---------|----------|---------|-----------------|-------------|---------|------------------------|---------|----------|---------|-------------|---------|------------|------------|------------|------------|----------------|--|
|                        |                             |                         | Fed.                     | St. | Co. | Munic. | Priv. |   | Land            | Water | Total | Mod.    | Non-Mod. | Un-dev. |                 | Dev.        | Un-dev. |                        |         |          |         |             |         | Cold Water | Warm Water |            |            |                |  |
| Grundy Co.             | Charles Nelson Mem. Park    | 1½ Mi. N. Jct. 14 & 185 |                          | 0   | X   |        |       |   | RestArea        | 1     |       | 1       |          |         |                 |             | *       |                        |         |          |         |             |         |            |            |            |            | Playground     |  |
|                        | Charles E. Shearn Mem. Park | 2 Mi. E. Grundy Center  |                          |     |     |        |       |   | RestArea        | 1     |       | 1       |          |         |                 |             | *       |                        |         |          |         |             |         |            |            |            | Playground |                |  |
|                        | Conrad Lime Quarry          | Conrad                  |                          |     |     |        |       |   | Fishing Access  | 4     | 1     | 5       |          |         |                 |             |         |                        |         |          |         |             |         | *          |            |            |            |                |  |
|                        | Stoche Fishing Access       | 4 Mi. S.E. Wellsburg    |                          |     |     |        |       |   | Fishing Areas   | 1     | 2     | 3       |          |         |                 |             | *       |                        |         |          |         |             |         |            | *          |            | Playground |                |  |
|                        | Wolf Creek Rec. Area        | 3 Mi. S.E. Beaman       |                          |     |     |        |       |   | VII             | 93    |       | 93      |          |         |                 |             |         |                        |         |          |         |             |         |            |            |            |            |                |  |
|                        | Izaak Walton League         | Grund Center            |                          |     |     |        |       |   | Service Unknown |       |       |         |          |         |                 |             |         |                        |         |          |         |             |         |            |            |            |            | Miniature Golf |  |
|                        | Miniature Golf              | Reinbeck                |                          |     |     |        |       |   | Service Unknown |       |       |         |          |         |                 |             |         |                        |         |          |         |             |         |            |            |            |            |                |  |
|                        | Gerbert Gutknecht Park      | 1½ Mi. W. Reinbeck      |                          | 0   | X   |        |       |   | RestArea        | 1     |       | 1       |          |         |                 |             | *       |                        |         | *        |         |             |         |            |            |            |            |                |  |
|                        | Ida M. Miller Mem. Park     | 8½ Mi. W. Grundy Center |                          | 0   | X   |        |       |   | RestArea        | 3     |       | 3       |          |         |                 |             | *       |                        |         | *        |         |             |         |            |            |            | Playground |                |  |
| J.H. Roadman Mem. Park | 1 Mi. W. Dike               |                         | 0                        | X   |     |        |       | RestArea                                    | 8               | 2     | 10    |         |          |         |                 | *           |         |                        | *       | *        |         |             |         | *          |            | Playground |            |                |  |
| Hardin Co.             | Tri-County Sportsman Club   | Ackley                  |                          |     |     |        |       |   | Service Unknown |       |       |         |          |         |                 |             |         |                        |         |          |         |             |         |            |            |            |            |                |  |
| Linn Co.               | Leonard Kloubec             | Fairfax                 |                          |     |     |        |       |   | Service Unknown |       |       |         |          |         |                 |             |         |                        |         |          |         |             |         |            |            |            |            |                |  |

0 - Ownership  
X - Management  
@ - Ownership and Management

TABLE 7  
RECREATION INVENTORY  
Cedar River Subbasin  
Iowa-Cedar Rivers Basin

| County      | Name                   | Location                | Ownership and Management |     |     |        |       | Recreation<br>Classification<br>or<br>Specialization | Acreage |       |       | Camping |              |             | Picnick-<br>ing | Shower<br>Comfort<br>Stalls | Shower<br>Stalls | Tennis | Boat<br>Access | Hunting | Fishing |             | Hunting | Swimming | Other                        |
|-------------|------------------------|-------------------------|--------------------------|-----|-----|--------|-------|--|---------|-------|-------|---------|--------------|-------------|-----------------|-----------------------------|------------------|--------|----------------|---------|---------|-------------|---------|----------|------------------------------|
|             |                        |                         | Fed.                     | St. | Co. | Munic. | Priv. |  | Land    | Water | Total | Mod.    | Non-<br>Mod. | In-<br>dev. |                 |                             |                  |        |                |         | Dev.    | In-<br>dev. |         |          |                              |
| Johnson Co. | Scott Church Way-side  | 3½ Mi. S.E. Iowa City   |                          | 0   | X   |        |       | RestArea   | 5       |       | 5     |         |              |             | *               | *                           | *                |        |                |         |         |             |         |          | Playground                   |
| Linn Co.    | Palisades-Kepler       | 3½ Mi. W. MountVernon   |                          | ☒   |     |        |       | III  | 589     | 10    | 599   |         | *            | *           | *               | *                           | *                | *      | *              |         |         | *           |         |          |                              |
|             | Palisades Access       | 5 Mi. W. MountVernon    |                          | 0   | X   |        |       | River Access   | 89      |       | 89    |         | *            |             | *               |                             |                  | *      | *              | *       |         | *           | *       |          |                              |
|             | Izaak Walton League    | Cedar Rapids            |                          |     |     |        | ☒     | Service Unknown                                      |         |       |       |         |              |             |                 |                             |                  |        |                |         |         |             |         |          |                              |
|             | GreenTee Driving Range | Cedar Rapids            |                          |     |     |        | ☒     | Service Unknown                                      |         |       |       |         |              |             |                 |                             |                  |        |                |         |         |             |         |          |                              |
|             | L-Mar Farm             | Marion                  |                          |     |     |        | ☒     | Vac.Farm   |         |       |       |         |              |             |                 |                             |                  |        |                |         |         |             |         |          |                              |
|             | Lewis Bottoms          | 1 Mi. S.W. Center Point |                          |     |     | ☒      |       | Wildlife Area  | 105     |       | 105   |         |              |             | *               |                             |                  | *      | *              | *       |         | *           |         |          |                              |
|             | South Cedar            | 3 Mi. S.E. Mt. Vernon   |                          |     |     | ☒      |       | III  | 160     | 2     | 162   |         | *            |             | *               |                             |                  | *      | *              | *       |         | *           | *       |          |                              |
|             | Morgan Creek Park      | 2½ Mi. W. Cedar Rapids  |                          |     |     | ☒      |       | II   | 104     |       | 104   |         | *            |             | *               |                             |                  |        |                |         |         |             |         |          | Handicapped Fac. & Playfield |
|             | Squaw Creek Park       | 1 Mi. S. Marion         |                          |     |     | ☒      |       | VII  | 591     |       | 591   |         |              |             |                 |                             |                  |        |                |         |         |             |         |          |                              |
|             | Wakema Park            | Center Point            |                          |     |     | ☒      |       | II   | 4       |       | 4     |         |              |             | *               |                             |                  |        |                |         |         |             |         |          |                              |
|             | Arrowhead Archery      | Marion                  |                          |     |     |        | ☒     | Service Unknown                                      |         |       |       |         |              |             |                 |                             |                  |        |                |         |         |             |         |          |                              |
|             | Waltonian Archery      | Marion                  |                          |     |     |        | ☒     | Service Unknown                                      |         |       |       |         |              |             |                 |                             |                  |        |                |         |         |             |         |          |                              |
|             | Cemar Amusement        | Cedar Rapids            |                          |     |     |        | ☒     | Service Unknown                                      |         |       |       |         |              |             |                 |                             |                  |        |                |         |         |             |         |          |                              |

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TABLE 7  
RECREATION INVENTORY  
Cedar River Subbasin  
Iowa-Cedar Rivers Basin

| County       | Name                      | Location                | Ownership and Management |     |     |                                     |       | Recreation Classification or Specialization           | Acreage |       |       | Camping |          |         | Picnicking Dev. | Picnicking Un-dev. | Boat Access | Shower | Shelters | Trails | Boat Access | Boating | Fishing    |            | Hunting | Swimming | Other            |  |
|--------------|---------------------------|-------------------------|--------------------------|-----|-----|-------------------------------------|-------|---|---------|-------|-------|---------|----------|---------|-----------------|--------------------|-------------|--------|----------|--------|-------------|---------|------------|------------|---------|----------|------------------|--|
|              |                           |                         | Fed.                     | St. | Co. | Munic.                              | Priv. |   | Land    | Water | Total | Mod.    | Non-Mod. | Un-dev. |                 |                    |             |        |          |        |             |         | Cold Water | Warm Water |         |          |                  |  |
| Linn Co.     | Lions Club Park           | Alburnett               |                          |     |     |                                     |       | <input checked="" type="checkbox"/> I Service Unknown |         |       |       |         |          |         |                 |                    |             |        |          |        |             |         |            |            |         |          |                  |  |
|              | Palo Marsh                | ½ Mi. N. Palo           |                          |     |     | <input checked="" type="checkbox"/> |       | Wildlife Area   | 113     |       |       | 113     |          |         |                 |                    |             |        |          | *      |             |         |            | *          | *       |          |                  |  |
|              | Wickiup Hill              | 2½ Mi. N.E. Palo        |                          |     |     | <input checked="" type="checkbox"/> |       | Wildlife Area   | 178     |       |       | 178     | *        |         |                 |                    |             |        |          |        | *           | *       | *          |            | *       | *        |                  |  |
|              | Lewis                     | 3 Mi. S.W. Center Pt.   |                          |     |     | <input checked="" type="checkbox"/> |       | Wildlife Area   | 455     |       |       | 455     |          |         |                 |                    |             |        |          |        |             |         |            | *          |         |          |                  |  |
|              | Chain Lake                | 1½ Mi. S.E. Palo        |                          |     |     | <input checked="" type="checkbox"/> |       | River Access  | 95      |       |       | 95      | *        |         | *               |                    |             |        |          | *      | *           | *       |            | *          |         |          |                  |  |
|              | Palisades-Dows            | 5 Mi. E. Ely            |                          |     |     | <input checked="" type="checkbox"/> |       | VII   | 162     |       |       | 162     |          |         |                 |                    |             |        |          |        |             |         |            |            |         |          |                  |  |
|              | Rock Island               | 2 Mi. N.W. Cedar Rapids |                          |     |     | <input checked="" type="checkbox"/> |       | VII   | 20      |       |       | 20      |          |         |                 |                    |             |        |          |        |             |         |            |            |         |          |                  |  |
|              | Abbe Creek School Museum  | 2 Mi. N.W. Mt. Vernon   |                          |     |     | <input checked="" type="checkbox"/> |       | VI  | 2       |       |       | 2       |          |         | *               |                    |             |        |          |        |             |         |            |            |         |          | Handicapped Fac. |  |
| Mitchell Co. | Pioneer Area              | 7 Mi. S.W. Riceville    |                          |     |     | <input checked="" type="checkbox"/> |       | III   | 14      |       |       | 14      |          |         | *               |                    |             | *      |          |        |             |         |            | *          |         |          |                  |  |
|              | Stacyville Park           | Stacyville              |                          |     |     | <input checked="" type="checkbox"/> |       | VII   | 7       |       |       | 7       |          |         |                 |                    |             |        |          |        |             |         |            |            |         |          |                  |  |
|              | Hwy. 9 Wayside            | 1½ Mi. W. Osage         |                          |     |     | 0                                   |       | X RestArea  |         |       |       |         |          |         | *               |                    |             |        |          |        |             |         |            |            |         |          |                  |  |
|              | Osage Cons Club           | Osage                   |                          |     |     |                                     |       | <input checked="" type="checkbox"/> Service Unknown   |         |       |       |         |          |         |                 |                    |             |        |          |        |             |         |            |            |         |          |                  |  |
|              | St. Ansgar Sportsmen Club | St. Ansgar              |                          |     |     |                                     |       | <input checked="" type="checkbox"/> Service Unknown   |         |       |       |         |          |         |                 |                    |             |        |          |        |             |         |            |            |         |          |                  |  |
|              | Carpenter Sportsmen Club  | Carpenter               |                          |     |     |                                     |       | <input checked="" type="checkbox"/> Service Unknown   |         |       |       |         |          |         |                 |                    |             |        |          |        |             |         |            |            |         |          |                  |  |

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X - Management  
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TABLE 7  
RECREATION INVENTORY  
Cedar River Subbasin  
Iowa-Cedar Rivers Basin

| County        | Name                       | Location             | Ownership and Management |     |     |        |       | Recreation<br>Classification<br>or<br>Specialization | Acreage |       |       | Camping |              |             | Picnick-<br>ing<br>Un-<br>Dev. | Modern<br>Rest<br>Station | Showers | Shelters | Trails | Boat<br>Access | Boating | Fishing       |               | Hunting | Swimming | Other |
|---------------|----------------------------|----------------------|--------------------------|-----|-----|--------|-------|--|---------|-------|-------|---------|--------------|-------------|--------------------------------|---------------------------|---------|----------|--------|----------------|---------|---------------|---------------|---------|----------|-------|
|               |                            |                      | Fed.                     | St. | Co. | Munic. | Priv. |  | Land    | Water | Total | Mod.    | Non-<br>Mod. | Un-<br>dev. |                                |                           |         |          |        |                |         | Cold<br>Water | Warm<br>Water |         |          |       |
| Mitchell Co.  | Little Cedar Trap Grounds  | Little Cedar         |                          |     |     |        |       | ☒ Service Unknown                                    |         |       |       |         |              |             |                                |                           |         |          |        |                |         |               |               |         |          |       |
|               | Halvorson Park             | 1½ Mi. S. St. Ansgar |                          |     |     | ☒      |       | VII  | 11      |       | 11    |         |              |             |                                |                           |         |          |        |                |         |               |               |         |          |       |
|               | Interstate Park            | Mitchell             |                          |     |     | ☒      |       | II   | 5       | 20    | 25    | *       |              | *           |                                |                           |         |          | *      | *              |         | *             |               | *       |          |       |
|               | Otranto Park               | Otranto              |                          |     |     | ☒      |       | VII  | 5       |       | 5     |         |              |             |                                |                           |         |          |        |                |         |               |               |         |          |       |
| Muscatine Co. | Moscow-Cedar R. Access     | Moscow               |                          |     |     | ☒      |       | River Access   | 4       |       | 4     | *       |              | *           |                                |                           |         |          |        | *              | *       |               | *             |         |          |       |
|               | Salisbury-Cedar R. Access  | 10 Mi. W. Muscatine  |                          |     |     | ☒      |       | VII  | 74      |       | 74    |         |              |             |                                |                           |         |          |        |                |         |               |               |         |          |       |
|               | Cedar River Access         | 4 Mi. N. Ranston     |                          |     |     | ☒      |       | Wildlife Area  | 652     |       | 652   |         |              |             |                                |                           |         |          |        | *              | *       |               | *             | *       |          |       |
|               | Wiese Slough               | 2 Mi. E. Atalissa    |                          |     |     | ☒      |       | Wildlife Area  | 1,294   | 256   | 1,550 |         |              |             |                                |                           |         |          |        | *              | *       |               |               |         |          |       |
|               | Hwy 6 & 38                 | 10 Mi. N. Muscatine  |                          |     |     | 0      |       | X RestArea   |         |       |       |         |              | *           |                                |                           |         |          |        |                |         |               |               |         |          |       |
|               | West Liberty KOA           | West Liberty         |                          |     |     |        |       | ☒ II   | 10      |       | 10    | *       |              |             | *                              |                           |         |          |        |                |         |               |               |         |          |       |
|               | Gladbrook Lakeholding Camp | Gladbrook            |                          |     |     |        |       | ☒ VII  | 159     | 1     | 160   |         |              |             |                                |                           |         |          |        |                |         |               |               |         |          |       |
| Tama Co.      | John Holmes Stables        | Traer                |                          |     |     |        |       | ☒ Service Unknown                                    |         |       |       |         |              |             |                                |                           |         |          |        |                |         |               |               |         |          |       |
|               | American Legion            | Traer                |                          |     |     |        |       | ☒ Service Unknown                                    |         |       |       |         |              |             |                                |                           |         |          |        |                |         |               |               |         |          |       |
|               | Ridge Rider Saddle Club    | Traer                |                          |     |     |        |       | ☒ Service Unknown                                    |         |       |       |         |              |             |                                |                           |         |          |        |                |         |               |               |         |          |       |

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TABLE 7  
RECREATION INVENTORY  
Cedar River Subbasin  
Iowa-Cedar Rivers Basin

| County    | Name                      | Location              | Ownership and Management |     |     |        |       | Recreation Classification or Specialisation | Acreage         |       |       | Camping |          |          | Picnicking Dev. dev. | Modern Restrooms | Showers | Shelters | Trails | Access | Boat | Roasting | Fishing    |            | Hunting | Swimming | Other |  |
|-----------|---------------------------|-----------------------|--------------------------|-----|-----|--------|-------|---|-----------------|-------|-------|---------|----------|----------|----------------------|------------------|---------|----------|--------|--------|------|----------|------------|------------|---------|----------|-------|--|
|           |                           |                       | Fed.                     | St. | Co. | Munic. | Priv. |   | Land            | Water | Total | Mod.    | Non-Mod. | Un. dev. |                      |                  |         |          |        |        |      |          | Gold Water | Warm Water |         |          |       |  |
| Tama Co.  | Dysart Boy Scout Park     | 5 Mi. N. Dysart       |                          |     |     |        |       | ☒ Service Unknown                           |                 |       |       |         |          |          |                      |                  |         |          |        |        |      |          |            |            |         |          |       |  |
|           | Gladbrook Lions Area      | 3 Mi. E. Gladbrook    |                          |     |     |        |       | ☒ Rest Area                                 | Service Unknown |       |       |         |          |          |                      | *                |         |          | *      |        |      |          |            |            |         |          |       |  |
|           | Gladbrook American Legion | 3 Mi. E. Gladbrook    |                          |     |     |        |       | ☒ Service Unknown                           |                 |       |       |         |          |          |                      |                  |         |          |        |        |      |          |            |            |         |          |       |  |
| Worth Co. | Hwy. 65 Wayside           | 1 Mi. N. Northwood    |                          | 0   |     |        |       | X RestArea                                  |                 |       |       |         |          |          |                      |                  |         |          | *      |        |      |          |            |            |         |          |       |  |
|           | Hole-In-One               | Northwood             |                          |     |     |        |       | ☒ Min. Golf                                 |                 |       |       |         |          |          |                      |                  |         |          |        |        |      |          |            |            |         |          |       |  |
|           | Deer Creek Forest         | 2½ Mi. N.W. Carpenter |                          |     |     | ☒      |       | Wildlife Area                               | 45              |       | 45    |         |          |          |                      |                  |         |          |        |        |      |          |            |            |         | *        |       |  |
|           | Deer Creek Game Area      | 7½ Mi. E. Northwood   |                          |     |     | ☒      |       | Wildlife Area                               | 40              |       | 40    |         |          |          |                      |                  |         |          |        |        |      |          |            |            |         |          |       |  |
|           | Deer Creek Wayside        | 2 Mi. N.W. Carpenter  |                          | 0   |     | X      |       | RestArea                                    | 1               |       | 1     |         |          |          |                      |                  |         |          | *      |        |      |          |            |            |         |          |       |  |

0 - Ownership  
X - Management  
☒ - Ownership and Management

TABLE 7  
RECREATION INVENTORY

Cedar River Subbasin  
Iowa-Cedar Rivers Basin

Sheet 13 of 14

| County             | Name                           | Location            | Ownership and Management |     |     |        |       | Recreation Classification or Specialisation | Acreage |       |       | Camping |          |          | Vacation Cabins | Picnick- ing |         | Systems Comfort Station | Showers | Shelters | Trails | Foot Access | Boating | Fishing    |            | Hunting | Swimming | Other |
|--------------------|--------------------------------|---------------------|--------------------------|-----|-----|--------|-------|---|---------|-------|-------|---------|----------|----------|-----------------|--------------|---------|-------------------------|---------|----------|--------|-------------|---------|------------|------------|---------|----------|-------|
|                    |                                |                     | Fed.                     | St. | Co. | Munic. | Priv. |   | Land    | Water | Total | Mod.    | Non-Mod. | Un. dev. |                 | Un-Dev.      | Un-Dev. |                         |         |          |        |             |         | Cold Water | Warm Water |         |          |       |
|                    |                                |                     |                          |     |     |        |       |   |         |       |       |         |          |          |                 |              |         |                         |         |          |        |             |         |            |            |         |          |       |
| Freeborn Co. Minn. | Geneva Lake                    | 1 Mi. S. Geneva     |                          | ☒   |     |        |       |   | 3       | 1944  | 1947  |         |          |          |                 |              |         |                         |         |          |        |             |         |            |            | *       | *        |       |
| Mower Co. Minn.    | Driesner Park                  | Austin              |                          |     |     | ☒      |       |   |         |       |       |         | *        |          |                 | *            |         |                         |         |          |        |             |         |            |            | *       |          |       |
|                    | Rose Creek Park                | Rose Creek          |                          |     |     | X      |       |   | 3       |       | 3     |         |          | *        |                 | *            |         |                         |         |          |        |             |         |            |            |         |          |       |
|                    | Brandt Larson                  | 5 Mi. NE Lyle       |                          | X   |     |        |       | Wildlife                                    | 171     |       | 171   |         |          |          |                 |              |         |                         |         |          |        |             |         |            |            | *       |          |       |
|                    | Red Cedar                      | 7 Mi. S. Austin     |                          | X   |     |        |       | Wildlife                                    | 41      |       | 41    |         |          |          |                 |              |         |                         |         |          |        |             |         |            |            | *       |          |       |
|                    | Cartney Slough                 | 5 Mi. NW LeRoy      |                          | X   |     |        |       | Wildlife                                    | 320     |       | 320   |         |          |          |                 |              |         |                         |         |          |        |             |         |            |            | *       |          |       |
|                    | Rose Creek Wildlife Mgt.       | 3 Mi. S. Rose Creek |                          | X   |     |        |       | Wildlife                                    | 50      |       | 50    |         |          |          |                 |              |         |                         |         |          |        |             |         |            |            | *       |          |       |
|                    | Austin Park & Rec.             | Austin              |                          |     |     | X      |       | Multiple Rec.                               | 150     |       | 150   | *       |          |          | *               |              | *       |                         |         |          |        |             |         |            |            |         |          |       |
|                    | Ramsey Golf Course             | Ramsey              |                          |     |     |        | X     | Golf  | 147     |       | 147   |         |          |          |                 |              |         |                         |         |          |        |             |         |            |            |         |          |       |
|                    | Cedar Valley Archery Range     | Lansing             |                          |     |     |        | X     | Archery Range                               | 37      |       | 37    |         |          |          |                 |              |         |                         |         |          |        |             |         |            |            |         |          |       |
|                    | Cedar Valley Conservation Club | 3 Mi. N. Austin     |                          |     |     |        | X     | Target Shooting                             | 41      |       | 41    |         |          |          |                 |              |         |                         |         |          |        |             |         |            |            |         |          |       |
|                    | Izaak Walton League            | Austin              |                          |     |     |        | X     | Target Shooting                             | 10      |       | 10    |         |          |          |                 |              |         |                         |         |          |        |             |         |            |            |         |          |       |
|                    | Adams Cons. Club               | Adams               |                          |     |     |        | X     | Target Shooting                             | 21      |       | 21    |         |          |          |                 |              |         |                         |         |          |        |             |         |            |            |         |          |       |
|                    | Cedar River Country Club       | 2 Mi. W. Adams      |                          |     |     |        | X     | Golf  | 149     |       | 149   |         |          |          |                 |              |         |                         |         |          |        |             |         |            |            |         |          |       |

0 - Ownership  
X - Management  
☒ - Ownership and Management

TABLE 7  
RECREATION INVENTORY

Cedar River Subbasin  
Iowa-Cedar Rivers Basin

Sheet 14 of 14

| County          | Name                        | Location                  | Ownership and Management |     |     |        |       | Recreation Classification or Specialization | Acreage |       |       | Camping |          |          | Vacation Cabins | Picnick-ing |          | Modern Comfort Station | Showers | Shelters | Trails | Boat Access | Roasting | Fishing    |            | Hunting | Swimming | Other |  |
|-----------------|-----------------------------|---------------------------|--------------------------|-----|-----|--------|-------|---|---------|-------|-------|---------|----------|----------|-----------------|-------------|----------|------------------------|---------|----------|--------|-------------|----------|------------|------------|---------|----------|-------|--|
|                 |                             |                           | Fed.                     | St. | Co. | Munic. | Priv. |   | Land    | Water | Total | Mod.    | Non-Mod. | Un. dev. |                 | Dev.        | Un. dev. |                        |         |          |        |             |          | Cold Water | Warm Water |         |          |       |  |
|                 |                             |                           |                          |     |     |        |       |   |         |       |       |         |          |          |                 |             |          |                        |         |          |        |             |          |            |            |         |          |       |  |
| Mower Co. Minn. | Cedar Valley Cons. Club     | 2 Mi. NW Adams            |                          |     |     |        | X     | Nature Preserve                             | 27      |       | 27    |         |          |          |                 |             |          |                        |         |          |        |             |          |            |            |         |          |       |  |
|                 | Braaten's Brookside Camping | 3 Mi. SE Blooming Prairie |                          |     |     |        | X     | Camping                                     | 35      |       | 35    | *       |          |          | *               | *           | *        | *                      |         |          |        |             |          |            | *          |         |          |       |  |
|                 | Mapleview Facilities        | Mapleview                 |                          |     |     | X      |       | Park Rec.                                   | 6       |       | 6     |         |          |          | *               |             |          | *                      |         |          |        |             |          |            |            |         |          |       |  |
|                 | Todd Park Facilities        | Austin                    |                          |     |     | X      |       | Park Rec.                                   | 87      |       | 87    |         |          |          | *               |             |          | *                      |         |          |        |             |          |            |            |         |          |       |  |
|                 | Brownsdale Facilities       | Brownsdale                |                          |     |     | X      |       | Park Rec.                                   | 2       |       | 2     |         |          |          | *               |             |          | *                      |         |          |        |             |          |            |            |         |          |       |  |
|                 | Elkton Facilities           | Elkton                    |                          |     |     | X      |       | Playground                                  | 7       |       | 7     |         |          |          |                 |             |          | *                      |         |          |        |             |          |            |            |         |          |       |  |
|                 | Adams Facilities            | Adams                     |                          |     |     | X      |       | Park Rec.                                   | 40      |       | 40    |         | *        |          | *               |             |          | *                      |         |          |        |             |          |            |            |         |          |       |  |
|                 | Austin Country Club         | Austin                    |                          |     |     |        | X     | Golf  | 105     |       | 105   |         |          |          |                 |             |          |                        |         |          |        |             |          |            |            |         |          |       |  |
|                 | Izaak Walton League         | 3 Mi. NW Austin           |                          |     |     |        | X     | Nature Preserve                             | 10      |       | 10    |         |          |          |                 |             |          |                        |         |          |        |             |          |            |            |         |          |       |  |
|                 | J.C. Hormel Nature Center   | Austin                    |                          |     |     | X      |       | Nature Study                                | 123     |       | 123   |         |          |          |                 |             |          |                        |         |          |        |             |          |            |            |         |          |       |  |

0 - Ownership  
X - Management  
\* - Ownership and Management

Figure 5 shows the general location of recreation facilities in the Sub-basin as well as the location of river reaches well suited for fishing and/ fishing and boating.

#### H. Mineral Resources

The important known mineral resources within the Cedar River basin consist of sand and gravel, and limestone and dolomite. Small portions of the basin are underlain by rocks known to contain gypsum.

The sand and gravel occurs mostly as alluvial (stream-deposited) deposits along the river and the larger tributaries. These materials are utilized almost entirely as construction aggregate, although they serve as sources of water for a number of municipal and many domestic supplies. The sand and gravel is rather evenly distributed throughout the basin.

Limestone and dolomite for use in highway construction and maintenance, agricultural limestone, and mineral feeds are available throughout the Cedar River basin.

Although gypsum is known to occur under small portions of the basin, deposits in sufficient thickness to warrant mining have not been found.

Geophysical surveys (magnetic and gravity) indicate unusual conditions in the rocks at considerable depth in the Waterloo-Cedar Falls area. In these areas the magnetic and gravity fields are distorted from the normal, which may be an indication of mineralization of the rock beneath this area. To verify this would require exploration drilling to depths not normally reached in water-well drilling in this vicinity.

#### I. Archeologic and Historic Sites

There are 52 historic areas, markers, or points of interest in the Sub-basin. These vary from an historic elm tree in Marion to the Presidential Museum at West Branch.

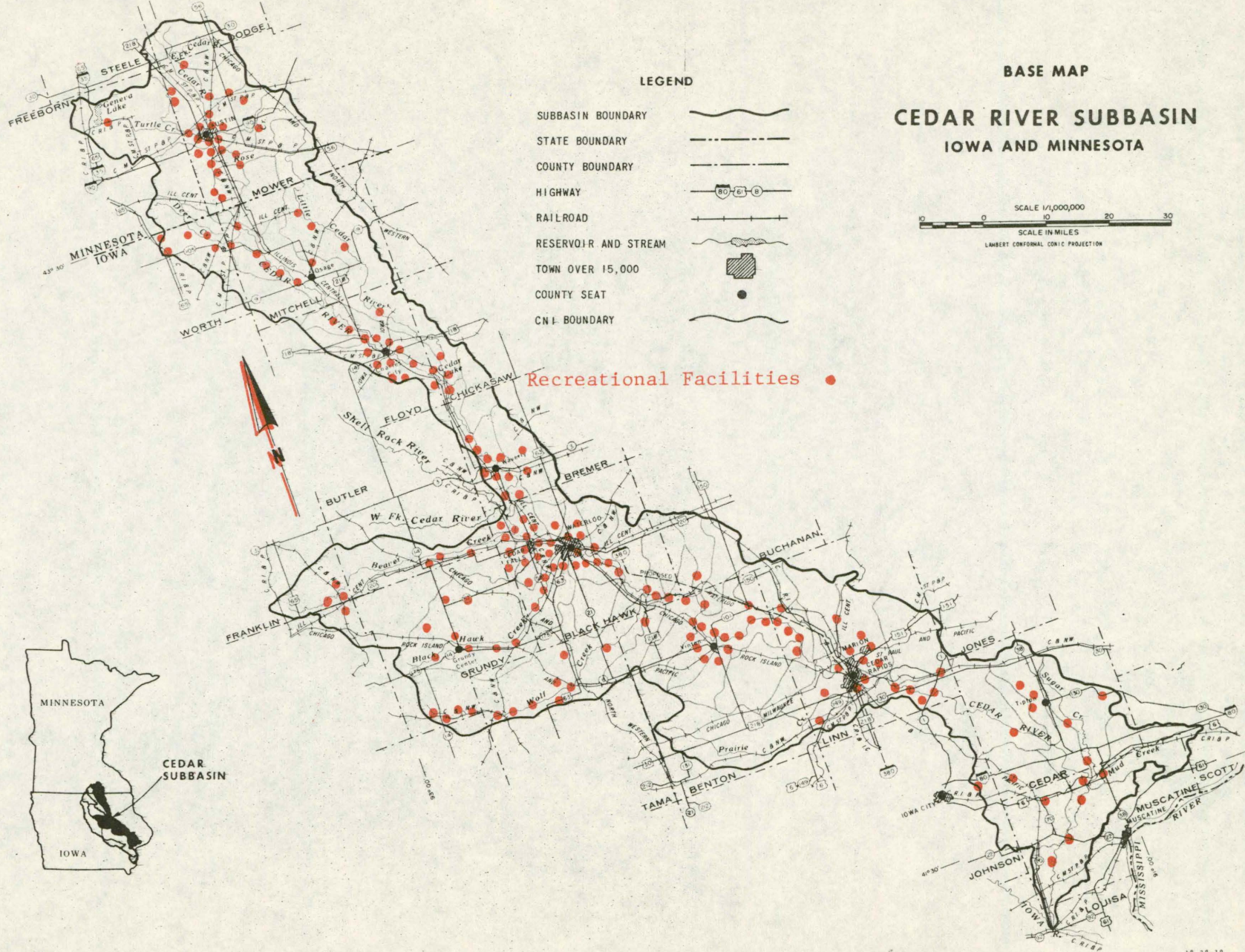
The State historic areas and points of interest are summarized in Table 8.

#### J. Early History







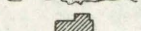
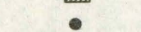

Settlement of the Cedar River Subbasin began as early as 1834 in Muscatine County. Montpelier was laid out in 1835 or 1836. The town of Bloomington, later renamed Muscatine, was laid out in 1836.

The area around Cedar Rapids received its first white settlers around 1837, two miles west of Mt. Vernon. When early settlers arrived at the site of Cedar Rapids in May 1838, they found Osgood Shepard operating a tavern on the banks of the Cedar River where First Avenue and First Street now intersect.



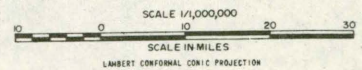


LEGEND

- SUBBASIN BOUNDARY 
- STATE BOUNDARY 
- COUNTY BOUNDARY 
- HIGHWAY 
- RAILROAD 
- RESERVOIR AND STREAM 
- TOWN OVER 15,000 
- COUNTY SEAT 
- C.N.I. BOUNDARY 

BASE MAP

CEDAR RIVER SUBBASIN  
IOWA AND MINNESOTA



Recreational Facilities ●

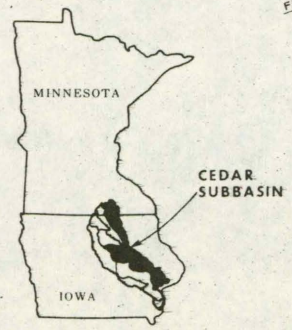


Figure 5

SOURCE:  
 U.S.G.S. 1:500,000 BASE MAPS (IOWA AND MINNESOTA).  
 U.S.G.S. 1:500,000 AERONAUTICAL CHARTS (DES MOINES AND DUBUQUE).  
 USDA SCS LINCOLN, NEBR. 1970

TABLE 8  
STATE HISTORIC AREAS, MARKERS AND POINTS OF INTEREST  
Cedar River Subbasin  
Iowa-Cedar Rivers Basin

Sheet 1 of 4

| Item                                       | County     | Location                                  | Ownership                      | Comment  |
|--|------------|---|--------------------------------|--|
| Barnum Home                                | Black Hawk | 303 Clay St.<br>Cedar Falls, Ia.<br>50613 | Cedar Falls Historical Society | Restored home built in 1862.   |
| Elm Land Mark                              | Black Hawk | Cedar Falls, Ia.                          |                                | Marker placed by D.A.R.*   |
| First Bell Tower<br>Cedar Falls            | Black Hawk | Cedar Falls, Ia.                          |                                | Marker placed by D.A.R.*   |
| First Home<br>(Black Hawk Co.)             | Black Hawk | Between Waterloo and Cedar Falls, Ia.     |                                | Marker   |
| First Public School<br>Cedar Falls         | Black Hawk | Cedar Falls, Ia.                          |                                | Marker placed by D.A.R.*   |
| First Log House<br>Waterloo                | Black Hawk | Waterloo, Ia.                             |                                | Marker placed by D.A.R.*   |
| Museum of History and Science              | Black Hawk | Park Ave. at S. St., Waterloo, Iowa       |                                | Founded in 1933 by H.W. Grout. No charge.  |
| Overman Park                               | Black Hawk | Cedar Falls, Ia.                          | City                           | Gift to city from the first mayor, J.M. Overman.   |
| Russell-Lamson Home                        | Black Hawk | W. Third and S. St., Waterloo, Iowa 50701 | Private                        | Restored Victorian home.   |
| Sullivan Park                              | Black Hawk | Webster & E. 4th, Waterloo, Ia.           | City                           | 8 acre park donated in honor of the five Sullivan brothers who lost their lives in World War II. |
| University of Northern Iowa Museum         | Black Hawk | Hudson Road Cedar Falls, Iowa             | University                     | Geology and historical exhibits.   |
| Fort John                                  | Bremer     | Janesville, Ia.                           |                                | Boulder with tablet marked by D.A.R.*  |
| Schild International Museum                | Bremer     | Bremer Ave. off U.S. 218 Waverly, Ia.     | Private                        | Collection of unusual objects.   |
| Waverly House                              | Bremer     | 402 W. Bremer Ave., Waverly, Ia. 50677    | Bremer Co. Historical Society  | First Hotel and Stagecoach stop built in Waverly, 1856, restored as museum.                      |
| Westburg No. 7 Community Center and museum | Buchanan   | 7½ mi. S.W. of Independence, Ia           | Private                        | Restored school built in 1883 and used until May 21, 1965.                                       |

TABLE 8  
 STATE HISTORIC AREAS, MARKERS AND POINTS OF INTEREST  
 Cedar River Subbasin  
 Iowa-Cedar Rivers Basin

Sheet 2 of 4

| Item                                       | County | Location  | Ownership   | Comment  |
|--|--------|---|---|--|
| Benton City Park                           | Benton | 9 Mi. E. of Vinton on Co. Road V                    | Benton Co. Conservation Bd.                         | First settlement in Benton County.   |
| Minnie Estema Park                         | Benton | 9 mi, N. of Vinton on old Brandon Road, Cedar River | State, managed by the Benton Co. Conservation Board | Remains of historic old resort hotel.                                      |
| Dutton Place                               | Cedar  | Durant, Iowa  | City  | American Gothic House built in 1855.                                       |
| Henry Hardman Home                         | Cedar  | S.E. of Tipton                                      | Private   | Site of first court, school and church in Cedar County. Marked by boulder. |
| Herbert Hoover Nat'l Historic Site         | Cedar  | West Branch, Iowa 52358                             | Foundation  | Presidential Museum.   |
| Statue of Isis                             | Cedar  | West Branch National Historical Site                |   | Placed by Belgian Army.  |
| Tipton Union School                        | Cedar  | 121 E. 2nd St. Tipton, Iowa                         |   | First free graded school W. of the Mississippi, River.                     |
| A.W. Story Cabin                           | Floyd  | Sec. 20, Twp. 95N Rge. 15W                          |   | Foundation of cabin of the first settler in the county.                    |
| Birthplace of the Farm Tractor             | Floyd  | Charles City, Ia.                                   | County  | Hart-Parr Company, 1913 model tractor on display.                          |
| Floyd County Museum                        | Floyd  | Charles City, Ia.                                   | Floyd Co. Historical Society                        | Former Drug and Grocery store of the 1880 era, now restored.               |
| Howardsville Church                        | Floyd  | Cedar Twp.  |   |  |
| Childhood Home of Carrie Lane Chapman Catt | Floyd  | S.E. of Charles City, Iowa                          | Private   | Two-story frame house.   |
| Lithograph City                            | Floyd  | N $\frac{1}{2}$ Sec. 25, Twp. 97N. Rge. 17W         | Private   | Remnants of the old town of Devonian. Lithograph limestone mine.           |
| Stagecoach Trail                           | Floyd  | N.E. corner of Riverton Twp.                        | Private   | Remnants of trail.   |

TABLE 8  
STATE HISTORIC AREAS, MARKERS AND POINTS OF INTEREST  
Cedar River Subbasin  
Iowa-Cedar Rivers Basin

Sheet 3 of 4

| Item   | County    | Location                                       | Ownership   | Comment  |
|--|-----------|--|---|--|
| Herbert Quick School                                   | Grundy    | Grundy Center, Ia.<br>Orian Park on<br>G. Ave. |   | Typical rural Iowa schoolhouse<br>attended by Herbert Quick, Author.                           |
| Abbie Creek School<br>Museum                           | Linn      | 2 mi. N.W. of<br>Mount Vernon, Ia.             | Linn Co.<br>Cons. Bd.   | One of the oldest standing brick<br>schoolhouses.  |
| Advent of the First<br>White Settler                   | Linn      | Mount Vernon,<br>Iowa                          |   | Marker placed by D.A.R.*   |
| Elm Tree Planted by<br>Preston Daniels                 | Linn      | Marion, Iowa                                   |   | Boulder marked by D.A.R.*  |
| First Frame Building                                   | Linn      | Cedar Rapids, Ia.                              |   | Marker placed by D.A.R.*   |
| Indian Artifacts and<br>Mounds                         | Linn      | Palisades-Kepler<br>State Park                 | State   | Indian mound location.   |
| Iowa Masonic Library<br>and Museum                     | Linn      | 813 First Ave.<br>S.E. Cedar Rapids            | Masons  | One of the oldest Masonic libraries<br>in the United States.                                   |
| Memorial to Willis G.<br>Haskill                       | Linn      | Cedar Rapids                                   |   | Marker placed by D.A.R.*   |
| Shakespeare Gardens                                    | Linn      | Ellis Park,<br>Cedar Rapids, Ia                |   | Contains plantings of trees and<br>shrubs mentioned or associated<br>with Shakespeare's plays. |
| Site of First<br>School House                          | Linn      | Cedar Rapids, Ia.                              |   | Marker placed by D.A.R.*   |
| Smith Home   | Muscatine | 3 mi. W. of<br>West Liberty, Ia.               |   | American rural Baroque architecture.   |
| Cedar Valley<br>Seminar, in honor<br>of Hamlin Garland | Mitchell  | Osage, Ia.                                     |   | Tablets placed by D.A.R.*<br>Hamlin Garland attended Cedar<br>Valley Seminar in 1881.          |
| Hamlin Garland<br>Home                                 | Mitchell  | N.E. of<br>Osage, Iowa                         |   | Boyhood home of Iowa author.   |
| Old Central Museum                                     | Mitchell  | N. 7th St.<br>Osage, Ia.<br>50461              | Osage<br>Community<br>School Dist.<br>Leased to<br>Hist. Soc. | Museum of pioneer exhibits.  |
| Saint Ansgar<br>Mill                                   | Mitchell  | ½ mi. S.W. of Saint Private<br>Ansgar, Iowa    |   | Operating watermill built in 1861.   |

TABLE 8  
 STATE HISTORIC AREAS, MARKERS AND POINTS OF INTEREST  
 Cedar River Subbasin  
 Iowa-Cedar Rivers Basin

Sheet 4 of 4

| Item                            | County   | Location                    | Ownership | Comment   |
|---------------------------------|----------|-----------------------------|-----------|---|
| Old Village of Moscow           | Freeborn | Moscow on Hwy #34           |           | Several houses, Town Hall, school and streets are still in evidence.                |
| Church Marker                   | Freeborn | Moscow                      |           | Site of first worship service in Freeborn County by Sylvester H. Phelps, 7/31/1856. |
| Stage Road                      | Freeborn | Geneva, Sec. 20,<br>29 & 32 |           | Old stage route east side of Geneva Lake.   |
| Mower County Historical Society | Mower    | Austin                      | County    | Historical Buildings and Collections.   |
| Chateau                         | Mower    | Lansing Twp.                | Private   | Stock Car Racing  |
| Old Mill Dam                    | Mower    | Lansing Twp.                | Municipal | Historical  |
| Chauncey Leverwich Grave        | Mower    | Austin                      | Private   | Historical  |

The first ferries across the Cedar River were in operation in the 1840's and a toll bridge was erected across the river in 1856.

The Quaker Oats Company plant was established in Cedar Rapids in the late 1860's for the manufacture of oatmeal.

The area around Cedar Falls, in Black Hawk County, saw its first permanent settlers in 1845. The Illinois Central Railroad reached Cedar Falls in 1861.

The northern part of the Subbasin was the last to be settled. The first white settlers reached Mitchell County in 1850, but no permanent settlement was made until 1852. St. Ansgar was settled in June 1853 by a group of Norwegians who arrived in a prairie schooner caravan of 30 wagons, 75 people, three horses, one carriage, and 150 head of cattle.

Herbert Hoover, first president of the U.S. born west of the Mississippi, was a native of West Branch, Iowa. The Hoover home, blacksmith shop, library, and grave are now a national shrine. Thousands of Americans and people of foreign birth come each year to pay tribute to one of the world's greatest humanitarians.

John Brown's headquarters during the winter of 1857-58 were located near Springdale, in Cedar County. There Brown made his plans for Harper's Ferry raid. Brown was hanged at the end of the venture at Harper's Ferry.

## II. WATER AND RELATED LAND RESOURCE PROBLEMS

### A. Land Resource Problems

There are 2.9 million acres of crop and pasture land in the Cedar River Subbasin.

Erosion is a problem on about 1.3 million acres of crop and pasture land. Of this, only 229,000 acres, or 18 percent, are considered adequately treated to control soil erosion according to present standards. The remaining 1.04 million acres, or 82 percent, are in need of conservation treatment. Erosion is by far the most critical land and water resource problem in the Subbasin. The expanding use of fertilizers and insecticides may make erosion an even greater problem in future years. Sediment from erosion is a carrier of water pollutants such as insecticides and phosphates that can damage our lakes and streams.

The subbasin has 850 thousand acres of cropland and pasture with a wetness hazard. A total of 450 thousand acres or 53 percent, are adequately treated to solve this drainage problem. The remaining 400 thousand acres, or 47 percent, needs to be treated for optimum production.

There are 193,000 acres of upstream floodplain with floodwater and sediment damage problems. Of this total, 165,000 acres will require project action for solving these floodwater and sediment problems. This does not mean, however, that these projects could be economically justified, but rather that group action is required for the problem solution.

In addition, there are 64,000 acres of floodplain along the main streams which also have floodwater and sediment damage problems.

The following urban areas have been identified as having some degree of floodwater and sediment problems: Cedar Falls, Cedar Rapids, Charles City, Evansdale, Waterloo, and Waverly in Iowa and Austin, Hollendale, Adams and Rose Creek in Minnesota.

The 1967 Conservation Needs Inventory for Watersheds identified 48 watershed areas in the Cedar Subbasin. Table 9 lists these watersheds and identifies the flooding and drainage problems of each.

#### B. Forest Resource Problems

Numerous uses are made of the forest resource including recreation, wildlife, livestock grazing, timber harvesting, and watershed protection. In many instances, several of these land uses can and do occur on the same piece of land simultaneously. However, in other cases, because of land use intensities and other factors, some uses are not compatible. For instance, excessive grazing of forest land can damage the forest resource to the extent that recreation, water quality, long-term timber harvesting, and wildlife values deteriorate. New subdivisions within a forested setting, while quite desirable from the owners standpoint, can effectively modify or eliminate other uses including various recreational activities, wildlife, timber harvesting, and watershed protection.

Other uses occur which unalterably eliminate the forest resource. Conversion to cropland or pasture, municipal-industrial development, transportation and utility rights-of-way, and water developments are probably the most significant uses contributing to a decline in forest acreage.

From the standpoint of maintaining or improving the forest resources for multiple use values now and in the future, the following problems and needs are recognized within the Subbasin. Reforestation is needed on over 26,000 acres, timber stand improvement is needed on 54,000 acres, forage improvement on 30,000 acres, and grazing reduction or elimination needed on over 31,000 acres.

Any change in land use from woodland to some other use reduces the useful multiple purpose of these wooded areas. Changes in use include conversion to cropland, pasture, urban subdivision developments, recreational developments, transportation, and the like. Each of these land use conversions either eliminate the wooded areas or reduces its effectiveness for multiple-use purposes.

TABLE 9  
WATERSHED INFORMATION

Cedar River Subbasin  
Iowa-Cedar Rivers Basin Study

Sheet 1 of 2

| Watershed               |     | Agriculture, Forest and<br>Sediment Damage |                           |                                       | Drainage                  |                                       |
|-------------------------|-----|--|---------------------------|---------------------------------------|---------------------------|---------------------------------------|
| Name                    | No. | Area<br>(acres)                            | Acres<br>with<br>Problems | Acres<br>Needing<br>Project<br>Action | Acres<br>with<br>Problems | Acres<br>Needing<br>Project<br>Action |
| Middle Fork Cedar R.    | 1   | 46,980                                     | 810                       | 600                                   | 33,500                    | 11,500                                |
| Roberts Creek           | 2   | 23,300                                     | 500                       | 100                                   | 18,000                    | 5,000                                 |
| Upper Cedar R.          | 3   | 83,780                                     | 7,672                     | 6,850                                 | 48,367                    | 25,650                                |
| Turtle Creek            | 4   | 96,770                                     | 21,300                    | 10,100                                | 50,000                    | 35,000                                |
| Rose Creek              | 5   | 41,540                                     | 1,200                     | 300                                   | 30,000                    | 13,000                                |
| West Beaver Creek       | 6   | 7,100                                      | 500                       | 0                                     | 4,000                     | 1,000                                 |
| Lower Cedar             | 7   | 71,940                                     | 19,720                    | 9,416                                 | 48,250                    | 25,000                                |
| Otter Creek             | 8   | 38,720                                     | 2,000                     | 1,000                                 | 17,500                    | 8,000                                 |
| Elk Creek               | 9   | 8,640                                      | 300                       | 100                                   | 2,851                     | 2,500                                 |
| Upper Deer Creek (Minn) | 10  | 16,190                                     | 5,000                     | 2,500                                 | 10,767                    | 8,000                                 |
| Lower Deer Creek (Iowa) | 11  | 41,500                                     | 6,400                     | 6,400                                 | 38,200                    | 31,300                                |
| Spring Creek            | 12  | 21,060                                     | 200                       | 200                                   | 10,140                    | 10,000                                |
| Rock Creek              | 13  | 44,610                                     | 700                       | 700                                   | 23,700                    | 20,200                                |
| Main & Tribs. (R.1)     | 14  | 69,050                                     | 1,400                     | 1,400                                 | 12,600                    | 11,000                                |
| Stewart Creek           | 15  | 9,150                                      | 500                       | 500                                   | 6,400                     | 5,000                                 |
| Little Cedar R. (Iowa)  | 16  | 169,470                                    | 4,500                     | 4,500                                 | 103,300                   | 80,800                                |
| Horton Creek            | 17  | 32,510                                     | 820                       | 620                                   | 18,800                    | 13,400                                |
| Quarter Section Run     | 18  | 54,910                                     | 1,350                     | 1,350                                 | 28,300                    | 14,000                                |
| Main & Tribs. (R.2)     | 19  | 156,420                                    | 7,100                     | 7,100                                 | 70,600                    | 42,500                                |
| Beaver Creek            | 20  | 250,240                                    | 22,600                    | 22,600                                | 114,700                   | 83,100                                |
| Unnamed Creek           | 21  | 12,700                                     | 600                       | 600                                   | 5,500                     | 1,000                                 |
| Blackhawk Creek         | 22  | 220,160                                    | 18,200                    | 18,200                                | 57,600                    | 22,100                                |
| Elk Run Creek           | 23  | 23,940                                     | 1,400                     | 1,400                                 | 12,000                    | 2,400                                 |
| Little Cedar R. (Minn.) | 24  | 37,250                                     | 300                       | 200                                   | 27,000                    | 13,000                                |
| Millers Creek           | 25  | 43,010                                     | 2,700                     | 2,700                                 | 11,200                    | 2,600                                 |
| Wolf Creek              | 26  | 209,890                                    | 27,700                    | 27,700                                | 84,200                    | 6,600                                 |
| Main & Tribs. (R.3)     | 27  | 115,520                                    | 19,000                    | 19,000                                | 35,500                    | 11,300                                |
| Rock Creek              | 28  | 24,580                                     | 1,500                     | 1,500                                 | 5,800                     | 1,100                                 |



TABLE 9  
WATERSHED INFORMATION

Cedar River Subbasin  
Iowa-Cedar Rivers Basin Study

Sheet 2 of 2

| Watershed           |     | Drainage     | Agric. FW and Sediment Damage |                              | Drainage            |                              |
|---------------------|-----|--------------|-------------------------------|------------------------------|---------------------|------------------------------|
| Name                | No. | Area (acres) | Acres with Problems           | Acres Needing Project Action | Acres with Problems | Acres Needing Project Action |
| Spring Creek        | 29  | 8,980        | 1,400                         | 1,400                        | 10,600              | 3,900                        |
| Lime Creek          | 30  | 26,820       | 660                           | 660                          | 13,000              | 5,000                        |
| Bear Creek          | 31  | 39,230       | 800                           | 800                          | 14,000              | 6,500                        |
| Pratt Creek         | 32  | 31,940       | 550                           | 550                          | 6,600               | 550                          |
| Hinkle Creek        | 33  | 19,460       | 600                           | 600                          | 3,800               | 400                          |
| Mud Creek           | 34  | 28,990       | 500                           | 500                          | 6,500               | 500                          |
| Blue Creek          | 35  | 40,320       | 400                           | 400                          | 9,200               | 400                          |
| Opossum Creek       | 36  | 63,100       | 1,400                         | 1,400                        | 13,800              | 1,200                        |
| Otter Creek         | 37  | 45,380       | 450                           | 450                          | 11,300              | 0                            |
| Main & Tribs. (R.4) | 38  | 133,380      | 9,900                         | 9,900                        | 33,200              | 7,500                        |
| Prairie Creek       | 39  | 138,240      | 6,000                         | 6,000                        | 32,700              | 5,100                        |
| Indian Creek        | 40  | 59,500       | 600                           | 600                          | 14,000              | 0                            |
| Big Creek           | 41  | 71,040       | 6,900                         | 6,900                        | 16,800              | 100                          |
| Rock Run Creek      | 42  | 14,910       | 300                           | 300                          | 3,700               | 1,200                        |
| Rock Creek          | 43  | 40,770       | 2,500                         | 2,500                        | 14,200              | 8,500                        |
| Main & Tribs. (R.5) | 44  | 165,760      | 11,100                        | 11,100                       | 37,300              | 7,400                        |
| Mud Creek           | 45  | 67,200       | 2,300                         | 2,300                        | 15,500              | 8,100                        |
| Sugar Creek         | 46  | 74,880       | 6,900                         | 6,900                        | 25,000              | 12,000                       |
| Wapsinonoc Creek    | 47  | 120,960      | 12,200                        | 12,200                       | 36,000              | 5,000                        |
| Main & Tribs. (R.6) | 48  | 121,600      | 15,500                        | 15,500                       | 24,000              | 7,100                        |

C. Water Problems- Quantity and Quality (Groundwater)  
Agricultural, Rural Domestic, and Livestock

There is no groundwater quality and quantity problem that is definable for the entire Cedar River basin. In general the upper bedrock aquifer in the basin is one of the most productive water-bearing zones in the state.

There are local areas where the upper bedrock aquifer is not as highly creviced as it is over most of the basin. In those areas yields from wells completed in that aquifer may not be large enough for more than domestic use. However, in those areas acidizing and development of the well will often increase the yield substantially.

Problems with the quality of the water from the upper bedrock aquifer also exist in local areas within the basin. In a number of places within the basin the upper bedrock aquifer is covered only by a relatively thin mantle of unconsolidated material. In those areas the aquifer is vulnerable to contamination by surface materials and it is not unusual for wells completed in this aquifer to produce water with rather high nitrate and coliform bacteria content.

Special care should be given to proper well construction in these areas. On the western fringe of the basin in Grundy and northwestern Tama Counties the dissolved solids content of the water is rather high.

Municipal and Industrial

The problems that pertain to the rural water supplies apply to some extent to the smaller municipalities and industries within the basin. However the alternate sources of water that are available to the larger users generally can be relied upon to provide ample supplies of good quality water.

Within the Cedar Rapids area the upper bedrock aquifer is the source of water supply for many businesses and industries. Withdrawal of large quantities of water from this aquifer has caused a progressive lowering of the piezometric surface in the central part of the city. The piezometric head has declined about 105 feet in approximately 70 years. At this time the rate of decline has been reduced because of changes in water usage. However, should the pumpage again be increased the rate of decline will increase and the affected area will expand. This could result in individual wells being affected and an increase in pumping costs.

III. SUBBASIN ENVIRONMENTAL QUALITY PROBLEMS

There are no severe problems of wastes being contributed to the Cedar River from municipalities and industries. Waterloo-Cedar Falls and Cedar Rapids municipality areas are both waste sources but both have additional waste treatment plants under construction. With the rapid

growth of these communities, it is expected that their waste treatment plant facilities will never quite catch up to their needs and these communities will remain as contributors of some waste pollution. Other towns and industries in the Subbasin either have adequate treatment plants or are in the process of upgrading their treatment plants to meet their needs.

Environmental quality problems in the Cedar River Subbasin include some that have already been mentioned. The most severe one is sheet erosion that is resulting in pollution and sediment problems. Damages occurring as a result of this erosion include siltation of lakes, farm ponds, floodways, drainage ditches, road and highway ditches and culverts. This sediment also reduces the water quality of streams and lakes by being a carrier of pollutants. Other environmental quality problems include inadequate wildlife cover and overgrazing of some of the existing woodland cover. Some streambank erosion exists along the Cedar River and two areas were noted that old automobiles were being used to stabilize the banks. This tends to impair the scenic values of the Cedar River. Many abandoned automobiles are located in the wooded areas of the Subbasin creating sight pollution and tending to destroy the aesthetic values of these areas.

There is an indication of overuse of recreational facilities in the Lake McBride and Coralville area which would indicate a need for additional water based recreational facilities for at least the Cedar Rapids area.

#### IV. SUBBASIN RESERVOIR SITE INVENTORY

An inventory of potential reservoir sites was made in the upstream area of the Cedar River Subbasin. The information developed for 42 sites was based upon information gathered by the Soil Conservation Service. There are a few other potential reservoir sites that were not inventoried that could provide water impoundments with surface areas of from 10 to 100 acres in size. It is felt that those that were inventoried are some of the most desirable sites. Location map, Figure 6 shows in general, sites are available throughout much of the Subbasin. However, three-fourths of the sites inventoried are located in the lower half of the Subbasin.

These sites present opportunities for water storage in the Cedar River Subbasin for floodwater storage; sediment control; recreation; and fish and wildlife development; water supply for rural domestic, livestock, municipal and industrial uses, and other beneficial uses. The inventory reflects only physical potential for storage in the Subbasin and economic justification of sites is not implied. More intensive on-site investigations should be made to substantiate topographic and geologic data before sites are selected for detailed planning and development.

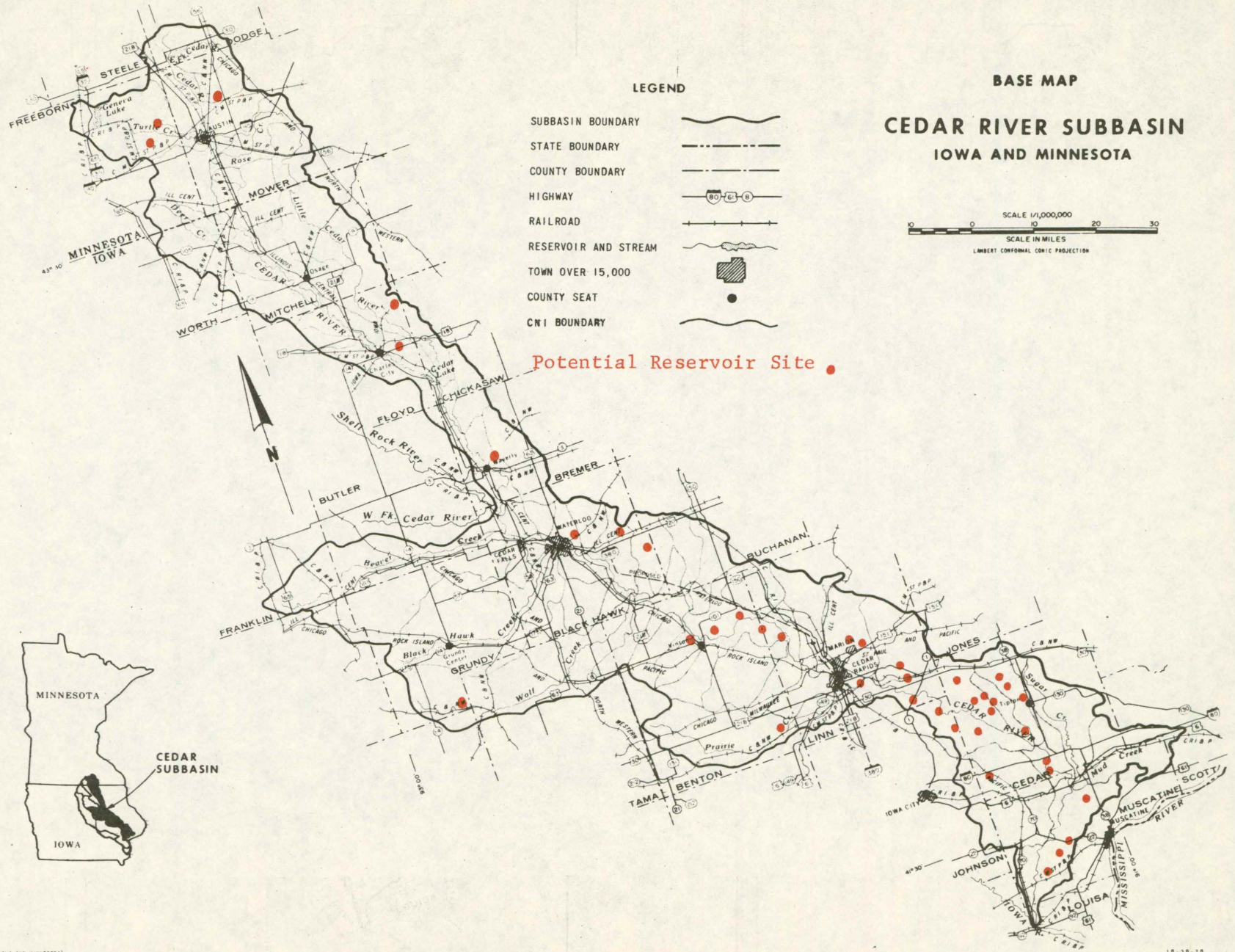
In general, sites were limited to drainage areas of under 50 square miles. Sites having significant adverse effects on railroads, Federal and State highways and county roads, towns, and concentration of buildings were avoided.

A representative group of reservoir sites in the Iowa-Cedar Rivers Basin were studied in detail to establish reservoir storage requirements for floodwater detention. In general maximum storage available for beneficial uses was based on anticipated annual water yield from the contributing drainage area. Reservoir storage includes sediment, beneficial use, and temporary floodwater. Beneficial storage includes all permanent storage, except for sediment, for any desired purpose. Structure data appears on Table 10.

Sediment volume needed was estimated for a 50-year period. Temporary flood storage required in this area is normally about four to five inches of runoff from the contributing watershed.

No reservoir costs have been developed for these sites.

A Soil Conservation Service inventory of farm ponds that have fishing potential shows that 224 exist in the Cedar Subbasin with surface areas of 1 to 5 acres, 10 with surface area of 5 to 10 acres, and 1 with surface area of over 10 acres. This inventory indicates that sites for small ponds are relatively plentiful in the southern three-quarters of the Subbasin. About 50 of the farm ponds inventoried are scattered throughout the area of the Subbasin north of Black Hawk County.



Potential Reservoir Site

Figure 6

SOURCE:  
 U.S.G.S. 1:500,000 BASE MAPS (IOWA AND MINNESOTA).  
 U.S.G.S. 1:500,000 AERONAUTICAL CHARTS (DES MOINES AND OUBOUIE).  
 USDA/SC/LEICHLER, REBR 1970

TABLE 10

POTENTIAL RESERVOIR SITE INVENTORY DATE  
Cedar River Subbasin  
Iowa-Cedar Rivers Basin

Sheet 1 of 3

| Site No.      | Location         |                  |       | Drainage Area<br>Sq. Miles | Est. Dam Height<br>Ft. | Storage Capacity             |                           |                                 |                  | Water Surface      |     |                               | Map Available in Report |
|---------------|------------------|------------------|-------|----------------------------|------------------------|------------------------------|---------------------------|---------------------------------|------------------|--------------------|-----|-------------------------------|-------------------------|
|               |                  |                  |       |                            |                        | Sediment (50 yr.)<br>Ac. Ft. | Beneficial Use<br>Ac. Ft. | Temporary Floodwater<br>Ac. Ft. | Total<br>Ac. Ft. | Multi-purpose Pool |     | Temporary Floodwater<br>Acres |                         |
|               | Minimum<br>Acres | Maximum<br>Acres |       |                            |                        |                              |                           |                                 |                  |                    |     |                               |                         |
|               | Sec.             | Twp              | Range |                            |                        |                              |                           |                                 |                  |                    |     |                               |                         |
| Benton Co.    |                  |                  |       |                            |                        |                              |                           |                                 |                  |                    |     |                               |                         |
| 6-6           | 1                | 85N              | 11W   | 3.7                        | 45                     | 200                          | 1,290                     | 890                             | 2,380            | 55                 | 95  | 135                           | X                       |
| 6-7           | 11               | 85N              | 10W   | 17.1                       | 60                     | 920                          | 5,930                     | 4,100                           | 10,950           | 210                | 460 | 670                           | X                       |
| 6-9           | 4                | 85N              | 9W    | 2.5                        | 50                     | 140                          | 870                       | 600                             | 1,610            | 40                 | 90  | 130                           | X                       |
| 6-10          | 24               | 85N              | 9W    | 4.5                        | 45                     | 240                          | 1,560                     | 1,080                           | 2,880            | 75                 | 150 | 215                           | X                       |
| 6-32          | 11               | 82N              | 9W    | 4.7                        | 40                     | 250                          | 1,630                     | 1,120                           | 3,000            | 80                 | 150 | 190                           | X                       |
| Black Hawk Co |                  |                  |       |                            |                        |                              |                           |                                 |                  |                    |     |                               |                         |
| 7-3           | 31               | 90N              | 12W   | 5.5                        | 35                     | 290                          | 1,760                     | 1,320                           | 3,370            | 120                | 220 | 330                           | X                       |
| 7-5           | 17               | 89N              | 11W   | 4.8                        | 40                     | 250                          | 1,540                     | 1,150                           | 2,940            | 80                 | 190 | 280                           | X                       |
| 7-6           | 13               | 88N              | 11W   | 8.8                        | 45                     | 470                          | 2,820                     | 3,290                           | 6,580            | 110                | 350 | 550                           | X                       |
| Bremer Co.    |                  |                  |       |                            |                        |                              |                           |                                 |                  |                    |     |                               |                         |
| 9-6           | 23               | 92N              | 14W   | 1.4                        | 30                     | 80                           | 450                       | 340                             | 870              | 30                 | 65  | 90                            | X                       |
| Cedar Co.     |                  |                  |       |                            |                        |                              |                           |                                 |                  |                    |     |                               |                         |
| 16-3          | 22               | 81N              | 4W    | 9.1                        | 45                     | 490                          | 3,900                     | 2,720                           | 6,500            | 120                | 320 | 420                           | X                       |
| 16-4          | 14               | 81N              | 4W    | 5.7                        | 50                     | 310                          | 2,440                     | 1,450                           | 4,200            | 80                 | 160 | 205                           | X                       |
| 16-5          | 35               | 81N              | 4W    | 2.1                        | 50                     | 140                          | 860                       | 510                             | 1,510            | 50                 | 90  | 125                           | X                       |
| 16-6          | 23               | 81N              | 3W    | 2.3                        | 35                     | 140                          | 885                       | 575                             | 1,600            | 60                 | 120 | 165                           | X                       |
| 16-11         | 27               | 80N              | 3W    | 23.2                       | 80                     | 1,240                        | 5,400                     | 5,760                           | 12,400           | 180                | 300 | 470                           | X                       |

TABLE 10

POTENTIAL RESERVOIR SITE INVENTORY DATE  
Cedar River Subbasin  
Iowa-Cedar Rivers Basin

Sheet 2 of 3

| Site No.                 | Location         |                  |     | Drainage Area<br>Sq. Miles | Est. Dam Height<br>Ft. | Storage Capacity             |                           |                                 |                  | Water Surface      |     |                               | Map Available in Report |
|--------------------------|------------------|------------------|-----|----------------------------|------------------------|------------------------------|---------------------------|---------------------------------|------------------|--------------------|-----|-------------------------------|-------------------------|
|                          |                  |                  |     |                            |                        | Sediment (50 yr.)<br>Ac. Ft. | Beneficial Use<br>Ac. Ft. | Temporary Floodwater<br>Ac. Ft. | Total<br>Ac. Ft. | Multi-purpose Pool |     | Temporary Floodwater<br>Acres |                         |
|                          | Minimum<br>Acres | Maximum<br>Acres |     |                            |                        |                              |                           |                                 |                  |                    |     |                               |                         |
| Cedar Co.<br>(continued) |                  |                  |     |                            |                        |                              |                           |                                 |                  |                    |     |                               |                         |
| 16-13                    | 6                | 79N              | 4W  | 1.9                        | 35                     | 130                          | 800                       | 460                             | 1,390            | 50                 | 100 | 130                           | X                       |
| 16-16                    | 14               | 79N              | 3W  | 4.2                        | 40                     | 230                          | 1,800                     | 1,010                           | 3,040            | 70                 | 160 | 205                           |                         |
| 16-17                    | 23               | 79N              | 3W  | 1.4                        | 40                     | 100                          | 600                       | 340                             | 1,040            | 30                 | 60  | 80                            | X                       |
| 16-19                    | 28               | 82N              | 4W  | 4.4                        | 65                     | 250                          | 1,050                     | 1,700                           | 3,000            | 50                 | 110 | 160                           | X                       |
| 16-21                    | 20               | 81N              | 3W  | 9.8                        | 50                     | 510                          | 4,000                     | 2,390                           | 6,900            | 120                | 360 | 490                           | X                       |
| 16-22                    | 11               | 81N              | 3W  | 11.8                       | 45                     | 630                          | 4,970                     | 2,800                           | 8,400            | 240                | 460 | 630                           | X                       |
| 16-23                    | 16               | 80N              | 4W  | 1.4                        | 40                     | 100                          | 600                       | 340                             | 1,040            | 30                 | 65  | 85                            | X                       |
| 16-24                    | 31               | 81N              | 4W  | 1.5                        | 40                     | 130                          | 640                       | 360                             | 1,130            | 40                 | 70  | 90                            | X                       |
| Floyd Co.                |                  |                  |     |                            |                        |                              |                           |                                 |                  |                    |     |                               |                         |
| 34-3                     | 34               | 97N              | 15W | 1.8                        | 40                     | 100                          | 530                       | 440                             | 1,070            | 40                 | 72  | 108                           | X                       |
| 34-9                     | 32               | 95N              | 15W | 2.4                        | 35                     | 130                          | 710                       | 580                             | 1,420            | 55                 | 94  | 141                           | X                       |
| Grundy County            |                  |                  |     |                            |                        |                              |                           |                                 |                  |                    |     |                               |                         |
| 38-10                    | 27               | 86N              | 17W | 4.5                        | 40                     | 240                          | 1,440                     | 1,080                           | 2,760            | 100                | 157 | 240                           | X                       |
| Johnson Co.              |                  |                  |     |                            |                        |                              |                           |                                 |                  |                    |     |                               |                         |
| 52-4                     | 3                | 81N              | 5W  | 2.8                        | 55                     | 240                          | 1,120                     | 630                             | 1,990            | 60                 | 105 | 145                           | X                       |
| 52-5                     | 23               | 81N              | 5W  | 5.8                        | 60                     | 440                          | 2,320                     | 1,300                           | 4,060            | 95                 | 175 | 230                           | X                       |

TABLE 10

POTENTIAL RESERVOIR SITE INVENTORY DATE  
Cedar River Subbasin  
Iowa-Cedar Rivers Basin

Sheet 3 of 3

| Site No.      | Location         |                  |     | Drainage Area<br>Sq. Miles | Est. Dam Height<br>Ft. | Storage Capacity             |                           |                                 |                  | Water Surface      |       |                               | Map Available in Report |
|---------------|------------------|------------------|-----|----------------------------|------------------------|------------------------------|---------------------------|---------------------------------|------------------|--------------------|-------|-------------------------------|-------------------------|
|               |                  |                  |     |                            |                        | Sediment (50 yr.)<br>Ac. Ft. | Beneficial Use<br>Ac. Ft. | Temporary Floodwater<br>Ac. Ft. | Total<br>Ac. Ft. | Multi-purpose Pool |       | Temporary Floodwater<br>Acres |                         |
|               | Minimum<br>Acres | Maximum<br>Acres |     |                            |                        |                              |                           |                                 |                  |                    |       |                               |                         |
| Linn County   |                  |                  |     |                            |                        |                              |                           |                                 |                  |                    |       |                               |                         |
| 57-1          | 5                | 84N              | 8W  | 3.7                        | 45                     | 200                          | 1,385                     | 890                             | 2,475            | 55                 | 130   | 195                           | X                       |
| 57-3          | 19               | 84N              | 6W  | 5.7                        | 45                     | 310                          | 2,130                     | 2,130                           | 4,570            | 95                 | 255   | 425                           | X                       |
| 57-4          | 20               | 84N              | 6W  | 22.8                       | 45                     | 1,220                        | 8,515                     | 8,515                           | 18,250           | 420                | 1,000 | 1,540                         | X                       |
| 57-7          | 17               | 83N              | 6W  | 10.3                       | 45                     | 550                          | 3,850                     | 2,480                           | 6,880            | 165                | 440   | 610                           | X                       |
| 57-11         | 18               | 83N              | 5W  | 12.8                       | 50                     | 690                          | ---                       | 3,080                           | 3,770            | 80                 | --    | 290                           | X                       |
| 57-20         | 6                | 82N              | 5W  | 1.2                        | 40                     | 80                           | 450                       | 270                             | 800              | 20                 | 60    | 75                            | X                       |
| 57-25         | 23               | 82N              | 6W  | 1.0                        | 50                     | 70                           | 375                       | 240                             | 685              | 15                 | 30    | 40                            | X                       |
| Muscatine Co. |                  |                  |     |                            |                        |                              |                           |                                 |                  |                    |       |                               |                         |
| 70-1          | 28               | 78N              | 2W  | 15.8                       | 45                     | 850                          | 850                       | 3,600                           | 5,300            | 260                | 260   | 410                           | X                       |
| 70-4          | 28               | 77N              | 3W  | 3.1                        | 60                     | 170                          | 1,280                     | 700                             | 2,150            | 40                 | 90    | 125                           | X                       |
| 70-5          | 23               | 77N              | 3W  | 3.3                        | 45                     | 180                          | 840                       | 740                             | 1,760            | 60                 | 95    | 155                           | X                       |
| 70-7          | 6                | 76N              | 3W  | 7.1                        | 45                     | 380                          | 1,160                     | 1,860                           | 3,400            | 145                | 145   | 300                           | X                       |
| Tama County   |                  |                  |     |                            |                        |                              |                           |                                 |                  |                    |       |                               |                         |
| 86-22         | 10               | 85N              | 15W | 1.6                        | 30                     | 100                          | 510                       | 375                             | 995              | 70                 | 70    | 95                            | X                       |



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