



1979

5-An Archaeological Survey of Kalamazoo County, Michigan: 1979 Multiple Transect Survey in the Middle Kalamazoo River Valley

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DEPARTMENT OF ANTHROPOLOGY
WESTERN MICHIGAN UNIVERSITY

ARCHAEOLOGICAL REPORT NO. 5
1979

AN ARCHAEOLOGICAL SURVEY OF KALAMAZOO COUNTY,
MICHIGAN: 1979 MULTIPLE TRANSECT SURVEY
IN THE MIDDLE KALAMAZOO RIVER VALLEY

WILLIAM M. CREMIN
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ACKNOWLEDGEMENTS

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We wish to extend out thanks to those who served as permanent personnel on project field teams and to the student volunteers from the WMU Archaeological Field School who participated in the survey as part of their field program of study.

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1. Prehistoric Site Survey in the Kalamazoo Basin

During the past six years, site survey has assumed an increasingly important role in Western Michigan University's archaeological research program in the Kalamazoo River Basin. In 1973, Dr. Elizabeth Garland (1976) initiated efforts to collect information regarding the whereabouts of archaeological sites then in the possession of local collectors and landowners. As a result of this informant survey, Garland and her associates recorded the locations for 225 sites in the drainage system and also documented the collections from them.

More recently, Garland and Dr. William Cremin have initiated long-term programs of systematic site survey in the basin. With the support of the National Register Grant Program administered through the Michigan History Division, the Kalamazoo Basin Survey (begun in 1976) and Settlement Pattern Survey (initiated in 1978) have been responsible for recording the vast majority of the more than 800 sites now known to exist in Allegan and Kalamazoo counties.

With the inception of Cremin's KBS program, the research objectives of survey work in this universe were for the first time oriented toward the systematic collection of locational data with which to make some meaningful statements about prehistoric subsistence-settlement behavior. During the past four years, 6 cross-valley transects have been established and investigated in an attempt to identify those environmental variables which in large part conditioned the selection of specific site loci for occupation and the activities which were undertaken from them.

Whereas KBS has focused on the river valley (Fig. 1), and it remains our intention to proceed upstream until we have succeeded in evaluating selected portions along the entire length of the Kalamazoo River, Garland's program,

initiated several years later, is aimed at studying prehistoric settlement patterns on a county-wide basis and is necessarily concerned only with that portion of the Kalamazoo Valley in Allegan County. Her survey, utilizing a different sampling strategy, in part duplicates our coverage, but also greatly enhances earlier results derived from KBS. Together, KBS and SPS provide an especially valuable data set for the Lower Kalamazoo Valley, making this area perhaps the best surveyed portion of the state.

Cremin's initial efforts to correlate the distribution of sites with aspects of the environment were undertaken in conjunction with the 1976 WMU Archaeological Field School. While the field school was excavating the multicomponent Hacklander site, located approximately 7 km above the mouth of the Kalamazoo River, a survey team began to investigate a 41 km² area encompassing the immediate site environs and extending upstream as far as the confluence of the Kalamazoo and Rabbit rivers (Fig. 1). Twelve km² of this transect were evaluated and 25 new sites added to those which had been previously recorded (Cremin 1978b; Neusius 1978):

During 1978, portions of the 1976 KBS transect were revisited by surveyors under the direction of Garland. Eleven units lying within the transect were included in a stratified random sample of quarter-sections (64.75 ha) drawn from the 2 westernmost tiers of townships in Allegan County. On this occasion, 67 new sites were recorded, bringing the total now known to occur within the area of the 1976 transect to 108 sites (Garland and Kingsley 1979).

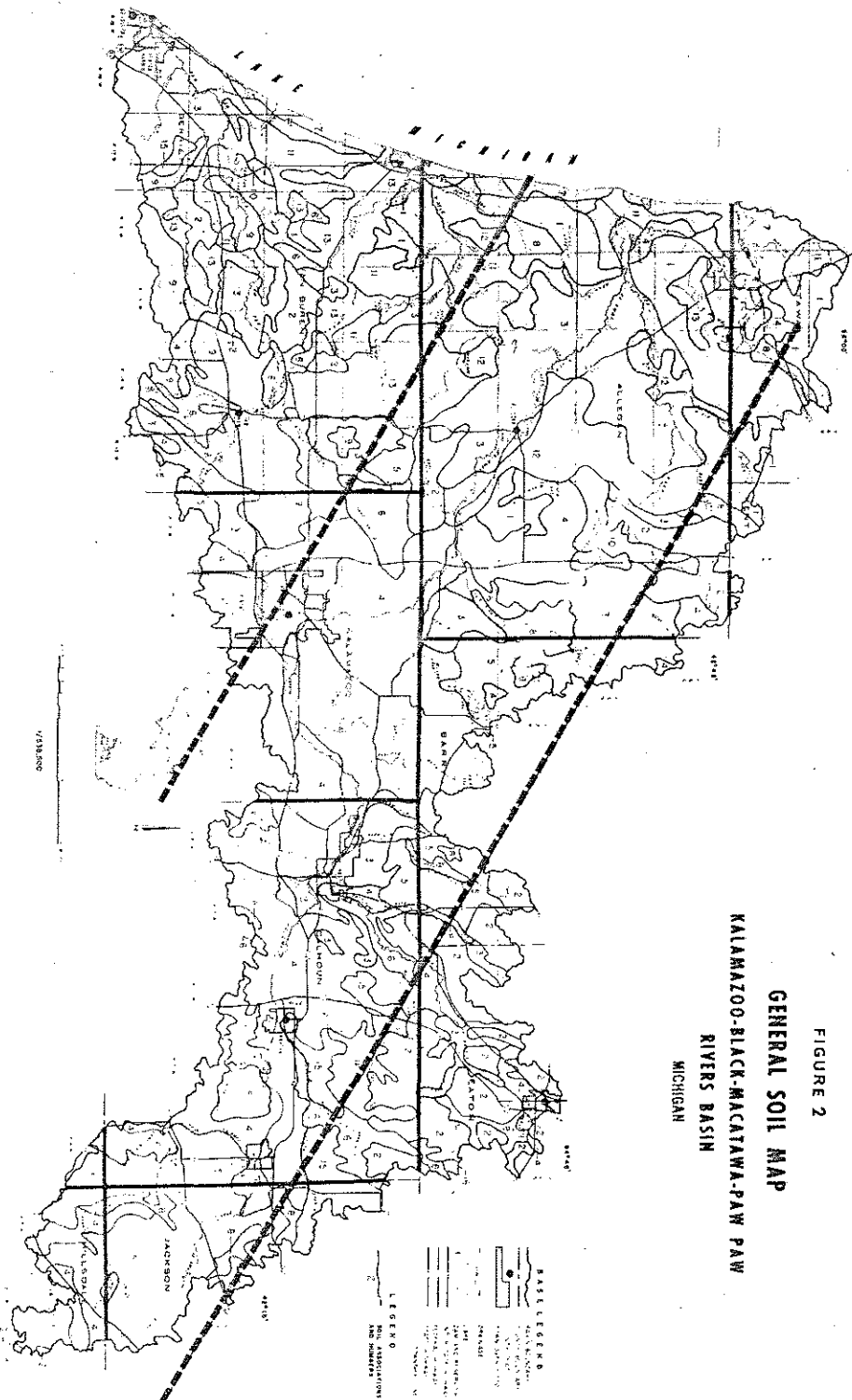
In 1977, as in the year of its inception, KBS was integrated with the field school, but with the addition of grant support for survey from the Michigan History Division. The area investigated was located 9 km upstream from the 1976 transect and included an area of 93 km², or the equivalent of one township (Fig. 1). This universe was stratified according to the distribution

of soils plotted on a recent map of the basin prepared by the USDA-Soil Conservation Service (1974; Fig. 2) and, secondarily, by rank ordering all permanent streams. Following Lovis (1976), the quarter-section was established as the sampling unit and a 40% stratified random sample was generated. Of 38 km² included in the sample, more than 14 km² were evaluated, with coverage by stratum varying from 32% to 47%, or 40% on the average. For our efforts we realized an addition of 62 sites to the 13 which had previously been recorded in this portion of the valley (Cremin 1978b; Cremin, Hoxie and Weston 1978).

Last year the Kalamazoo Basin Survey moved upstream into the Middle Kalamazoo Valley almost to the Allegan-Barry-Kalamazoo county lines, where multiple transects were established for investigation simultaneously by 2 teams of surveyors (Fig. 1). As in past years, this research was carried out in conjunction with the field school, and for the second year our program benefitted from grant support provided by the Michigan History Division. Transects A and B (Fig. 1) each encompassed 93 km², and were centered on the communities of Allegan and Otsego, respectively. To facilitate systematic investigation of the project area in the 6 weeks allotted, we maintained the stratified random sampling strategy adopted in 1977. In Transect A, 38.2 km² were targeted for investigation. More than 16.6 km² were intensively surveyed, with coverage by stratum ranging from 36.5% to 109.5%, or 51.4% on the average. In Transect B, 36.9 km² were included within the sample. Surveyors working this area succeeded in evaluating 16.1 km², with coverage by stratum ranging between 34% and 59.2%, or 45.6% on the average. In aggregate, coverage of 32.7 km² in the 1978 transects resulted in the recording of 157 new sites, bringing the total now known to occur in the project area to 166 sites (Cremin and Marek 1978).



FIGURE 2
GENERAL SOIL MAP
KALAMAZOO-BLACK-MACATAWA-PAW PAW
RIVERS BASIN
MICHIGAN



GENERAL SOIL MAP OF THE KALAMAZOO-BLACK-MACATAWA-PAW PAW RIVERS BASIN, MICHIGAN, BASED ON DATA FROM THE 1950'S AND 1960'S. THIS MAP IS A GENERALIZATION OF THE DATA AND DOES NOT REPRESENT THE ACTUAL SOIL DISTRIBUTION. FOR MORE DETAILED INFORMATION, SEE THE SOIL SURVEY MAPS OF THE AREA.

This year KBS investigated multiple transects in Kalamazoo County (Fig. 3). Once again, the survey program was integrated with the annual field school, and for the third year we received grant support from the Michigan History Division. There follows a report of the activities of the 1979 Kalamazoo Basin Survey, together with a brief description of the project area and those sites which were recorded during the 6 week field program.



Figure 3



2. The 1979 Project Area

In 1979, the Kalamazoo Basin Survey moved upstream into the middle valley of Kalamazoo County, establishing and investigating one transect located between the Allegan-Barry-Kalamazoo county lines and the City of Kalamazoo, and a second transect situated across the valley at a point about 4.8 km east of the city (Fig. 3). Transect A encompasses 93.2 km² of Richland and Cooper townships and Transect B comprises 83.5 km² of Richland, Ross, Comstock and Charleston townships. As in past years, transect boundaries are purposefully irregular, reflecting our efforts to include within the study areas as much ecological diversity as possible.

In contrast to portions of the valley previously investigated by KBS (Cremin 1978b; Cremin, Hoxie and Weston 1978; Cremin and Marek 1978), with their highly varied, transitional forest communities and often extensive swamp associations, Kalamazoo County, at the time of Euro-American settlement, was notable for its dense stands of Beech-Maple and Oak-Hickory forest, interspersed with attractive "oak openings" and tall grass prairies. Here, in an area of some 1492 km², Beech-Maple Forest constituted 363 km² (24%) and wetlands aggregated 181 km² (12%). The most prevalent community was the Oak-Hickory Forest, covering as it did about 855 km² (57%) of the county. Finally, 9 areas of prairie delineated on early county maps represent the remaining 93 km² (7%). And it was this last "setting" which proved most attractive to land hungry populations arriving from the East (Kenoyer 1930: 212; Peters 1970: 15).

As we entered the field, we were very cognizant of the role of prairies and, secondarily, "openings" in the settlement of the county. We also reasoned that it was here that we might encounter a late prehistoric/

protohistoric site representative of the agricultural pursuits of the native residents of southwest Michigan. During 3 previous seasons of survey downstream from Kalamazoo County, Late Woodland village sites had eluded us. Perhaps now systematic site survey procedures would pay off, rewarding our efforts with the kind of site so often hinted at in the documents relating to the early contact period.

Transect A (Fig. 4) lies due north of the City of Kalamazoo and extends in an east-west direction from Gull Lake to within .8 km of US-131, providing an overall length of 17.7 km. North-south dimensions vary from 1.6 to 9.7 km, with the average width of the transect being 5.3 km. Within the area delineated, surveyors frequently gained access to large, contiguous parcels of land where surface visibility ranged from good to excellent. And, importantly, all potential resource zones identified in the original land survey records are well represented here.

Transect B (Fig. 5) lies east of the city and extends from Gull Lake on the north to a point about 2.4 km south of Morrow Lake, an impoundment of the Kalamazoo River between the communities of Comstock and Galesburg. This transect has an overall length of 15.3 km. East-west dimensions range between 3.2 and 8.8 km, with the mean width of the transect being 6.3 km. This area possesses greater ecological diversity than Transect A. However, it lacks the extensive tracts of cultivated land found in the latter area. Here, surveyors had to contend with small, discontinuous parcels having good surface visibility, and our coverage of randomly selected sampling units was adversely affected. Be that as it may, those portions of Transect B which were ultimately accessible to surveyors did yield some valuable information clearly contributing to the overall success of this year's research project.

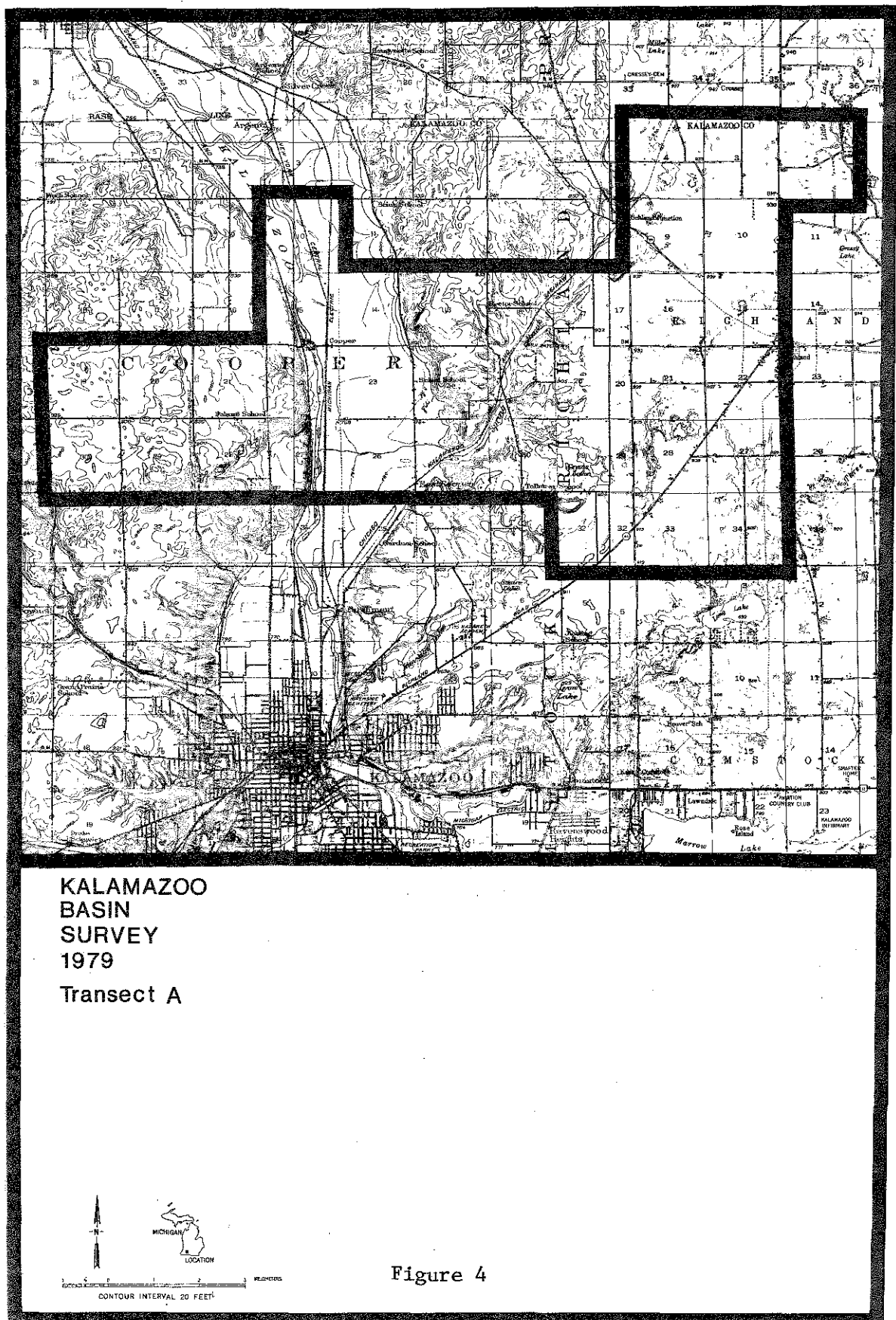


Figure 5

3. Previous Archaeological Research in the Project Area

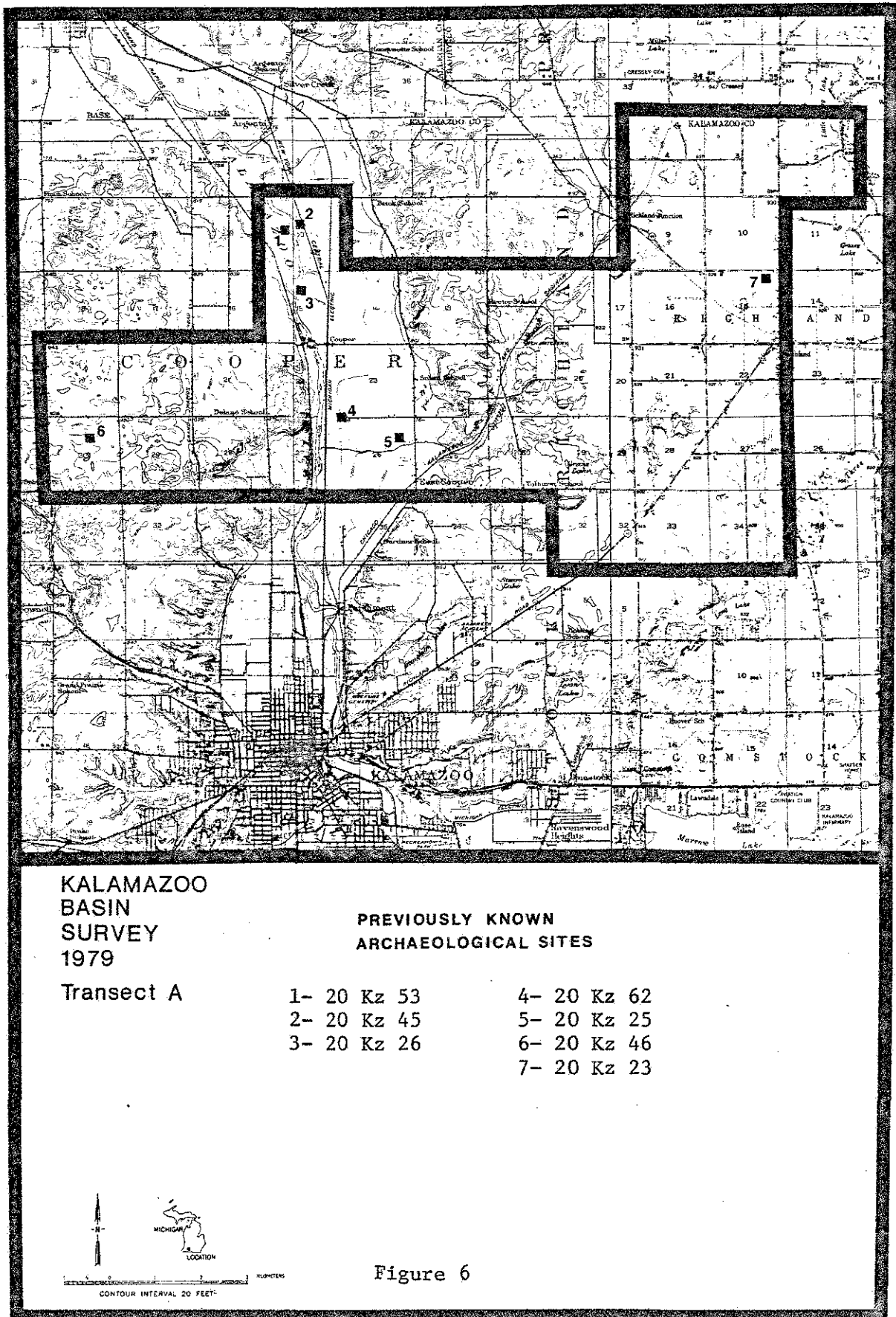
As was the case in both 1977 and 1978, little prior archaeological research has been undertaken in the Kalamazoo County project area. A thorough examination of the state site files maintained by the University of Michigan and the files kept here at Western Michigan University revealed a total of 71 known sites in the county. Of these, 7 were found to occur in the area of Transect A (Fig. 6) and an additional 7 sites were located in Transect B (Fig. 7).

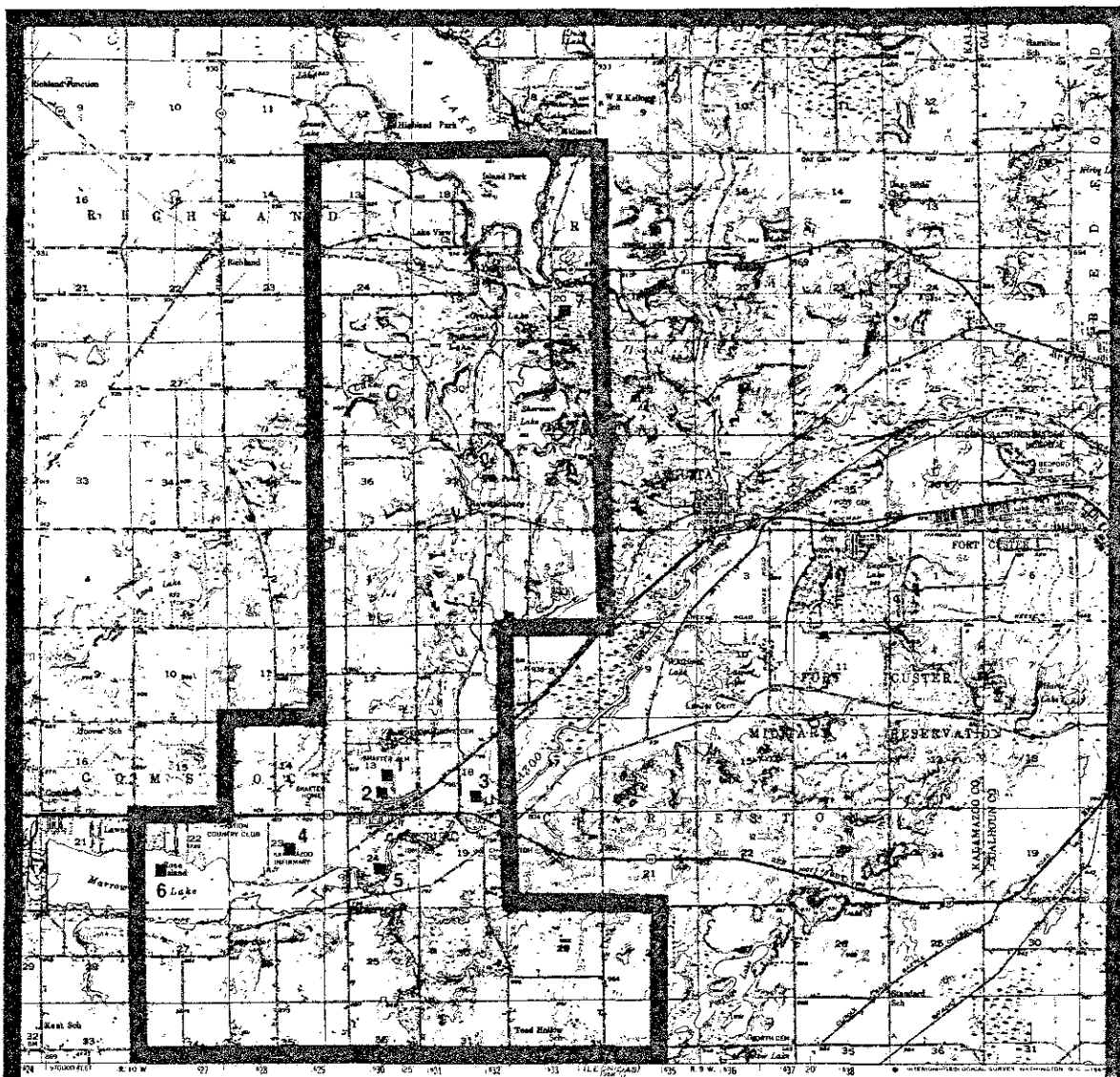
In keeping with our past practice of revisiting known sites, KBS surveyors did make every effort to both confirm their reported locations and to assess their current status, i.e. to ascertain whether any of them had been adversely impacted since the time of their having been recorded.

The brief descriptions which follow summarize data in the existing files and also provide some information regarding our attempt to relocate these sites.

A. Previously Known Sites in Transect A

- 20 Kz 23 Two mound located northeast of Richland in Section 15, Richland Township, T1S R10W, Kalamazoo County, Michigan. Neither of these features was observed upon investigation of the area by our crew.
- 20 Kz 25 Mound located northeast of Spring Brook in Section 26, Cooper Township, T1S R11W, Kalamazoo County, Michigan. Most of the property which the survey crew wanted to examine was not accessible by wishes of the current property owner. However, visual reconnaissance from the nearby road as well as adjacent parcels to which we gained access revealed no surface features suggesting the presence of a mound.
- 20 Kz 26 Village located on the right bank of the Kalamazoo River in Section 15, Cooper Township, T1S R11W, Kalamazoo County, Michigan. Due to conditions of extremely dense vegetative cover, the survey crew was unable to fully evaluate this area and confirm the presence of the site.





**KALAMAZOO
BASIN
SURVEY
1979**

**PREVIOUSLY KNOWN
ARCHAEOLOGICAL SITES**

Transect B

- | | |
|-------------|----------------|
| 1- 20 Kz 18 | 4- 20 Kz 70 |
| 2- 20 Kz 43 | 5- 20 Kz 59 |
| 3- 20 Kz 14 | 6- 20 Kz 19/44 |
| | 7- 20 Kz 106 |



Figure 7

- 20 Kz 45 Governor Throop Farm Mound. Mound located east of the river in Section 10, Cooper Township, T1S R11W, Kalamazoo County, Michigan. Investigation of the reported location of this site failed to reveal the presence of a mound.
- 20 Kz 46 A.R. Allen Mound. Mound located in the W 1/2, NE 1/4, Section 30, Cooper Township, T1S R11W, Kalamazoo County, Michigan. No mound was observed during systematic evaluation of this parcel by the survey team.
- 20 Kz 53 Borden. Paleo-Indian/Archaic site located in the NW 1/4 of Section 10, Cooper Township, T1S R11W, Kalamazoo County, Michigan. No evidence in the form of prehistoric cultural debris was encountered by the survey crew in this area. However, some property bordering the river, then under cultivation, could not be evaluated.
- 20 Kz 62 Nagel. Late Archaic site located in the SE 1/4, Section 22; SW 1/4, Section 23; NW 1/4, Section 26 and NE 1/4, Section 27, Cooper Township, T1S R11W, Kalamazoo County, Michigan. This property was not accessible to the survey crew by wishes of the property owner.

B. Previously Known Sites in Transect B

- 20 Kz 14 Village (and pits) located north of the Kalamazoo River and east of Galesburg in Section 18, Charleston Township, T2S R9W, Kalamazoo County, Michigan. Although the remains of an aboriginal village and/or associated features were not observed in this area, surveyors did recover a single projectile point just east of the Gull Lake Outlet in the center, E 1/2, SW 1/4, SE 1/4 of Section 18 on the Troff, Breneman and File property.

- 20 Kz 18 Mound located in Galesburg, Section 13, Comstock Township, T2S R10W, Kalamazoo County, Michigan. The survey crew could not relocate this presumably aboriginal feature.

- 20 Kz 19/44 Village and garden beds located along a loop in the Kalamazoo River in Section 22, Comstock Township, T2S R10W, Kalamazoo County, Michigan. This site description corresponds to Rowe Island in Morrow Lake, an impoundment of the river between the communities of Comstock and Galesburg. The associated (?) mound is reportedly located on the island. Careful investigation of the shoreline as well as a visit to the island failed to produce any evidence of the village and garden beds (20 Kz 19) or the mound feature (20 Kz 44).

- 20 Kz 43 Toland Garden Beds. Garden beds or ridged fields located in Section 13, Comstock Township, T2S R10W, Kalamazoo County, Michigan. Although these beds may have at one time existed in what is now the town of Galesburg, they could not be relocated by surveyors.

- 20 Kz 59 Galesburg Site. Historic Indian cemetery located in Section 24, Comstock Township, T2S R10W, Kalamazoo County, Michigan. This site was not visited by the survey crew. However, local informants placed its location nearer to the river in the center, S 1/2 of Section 24.

- 20 Kz 70 Roswell Ransom Garden Beds. Garden beds located in the W 1/2, NE 1/4, Section 23, Comstock Township, T2S R10W, Kalamazoo County, Michigan. In seeking to relocate this site, the survey crew did encounter a scatter of lithic debris at the appropriate place. In addition, surveyors were informed that a local collector had recovered a ground stone ax in the general vicinity, but at a spot closer to the river.

- 20 Kz 106 Hanson Site. This site is situated in the SW 1/4, SE 1/4, Section 20, Ross Township, T1S R9W, Kalamazoo County, Michigan. It was reported to WMU several years ago, on the occasion of the discovery of a cache of blades in the bog behind the Hanson home. The survey team recovered a piece of chert and a crudely worked bifacial tool on high ground immediately west of this same bog, but on the opposite side of 38th street.

4. Site Survey Methodology

A. Research Design

In order to accomplish the systematic investigation of the project area in the time allotted, both survey transects were stratified and randomly sampled. The following criteria were used to stratify the transects:

1. the distribution of soils as plotted on the USDA-Soil Conservation Service (1974) map of the Kalamazoo River Basin (Fig. 2);
2. rank ordering of all permanent streams flowing through the transects as well as considering all upland swamp and lake associations; and
3. mapping the distribution of 4 major plant communities found in the county at the time of the original land office surveys (Kenoyer 1930; Peters 1969).

Soils occurring within the 1979 transects are assigned to a single soil association:

Kalamazoo-Oshtemo (4)

These are coarsely textured soils lying on level to gently sloping topography. They are developed in sand, sandy loam and clay loam overlying stratified sand and gravel. They are well-drained soils with medium to high permeability rates. Woodland suitability information for the soils comprising this association indicates that the potential productivity for hardwoods is very high.

Given that only one association is present, soils data have not been very useful for purposes of stratifying our transects. The 1979 transects lack the soil variability noted for areas evaluated in previous years. Each of the transects investigated this year was, therefore, initially subdivided for purposes of sampling by noting whether or not permanent streams

were present and, if present, their rank order relative to one another. Areas of upland swamp or lake associations were also distinguished for purposes of stratification. For those portions of the Kalamazoo-Oshtemo association lacking permanent streams, the association number (4) is followed by "zero" (0). If an area borders on the Kalamazoo River, the numbers 4-1 are used to distinguish the sampling stratum; 4-2, second order stream; 4-3, upland swamp; and 4-4, lake.

Finally, each sampling stratum designation ends with a letter (A-D) referencing one of the 4 major plant communities formerly occurring in the county. These are:

A. Wetlands

A vegetative cover commonly associated with areas having high water tables or experiencing seasonal inundation. The term "heavy timber" is usually employed in this context, with the species represented being tamarack, ash, elm, soft maple, sycamore and in the northwest portion of Kalamazoo County, pine. Marshes or meadows (wet prairies) are low lying areas supporting sedges, ferns, reeds or, more commonly, tall coarse grasses, usually with patches of open water in the middle.

B. Beech-Maple Forest

This plant association was formerly well represented on soils of high clay content or sandy soils occurring in upland areas which were not saturated during seasonal flooding or did not have high water tables. Species having moderate moisture requirements and common to this association include beech, sugar maple, basswood or linden and poplar. Frequent associates are elm, cherry, aspen, butternut, hickory and ash. According to the land survey records, this association was especially well developed on uplands flanking the south side of the Kalamazoo River in Comstock Township and on the west side of the river in Cooper Township.

C. Oak-Hickory Forest

This community constituted the dominant association at historic contact, and was especially prominent on sandy soils of outwash plains and moraines. Oaks (principally the white oak), hickories and hazelnut were well represented. And when undergrowth is mentioned in the survey records, grasses or weeds, vines, briars and scrub oaks constituted the ground cover. All 5 townships included within the transects featured this community; however, it was best developed in Ross, Richland and Charleston townships.

D. Prairies

This plant association received considerable comment in documents relating to Euro-American settlement of the county. Prairies were located at high elevations on coarsely textured glacial outwash or drainage-way fillings of level to gently rolling topography. Analysis of the extant data has led Peters (1969: 95) to conclude that prairies were essentially treeless, grassy plains, numbering 9 in the county. Formerly, areas of prairie occurred in both transects. Gull Prairie in Richland Township and Toland's Prairie in Comstock Township were evaluated during the project.

When all these data are taken together, for example, a portion of the Kalamazoo-Oshtemo association bordering the Kalamazoo River in an area where climax Oak-Hickory Forest dominated at the time of settlement would be assigned to sampling stratum 4-1-C.

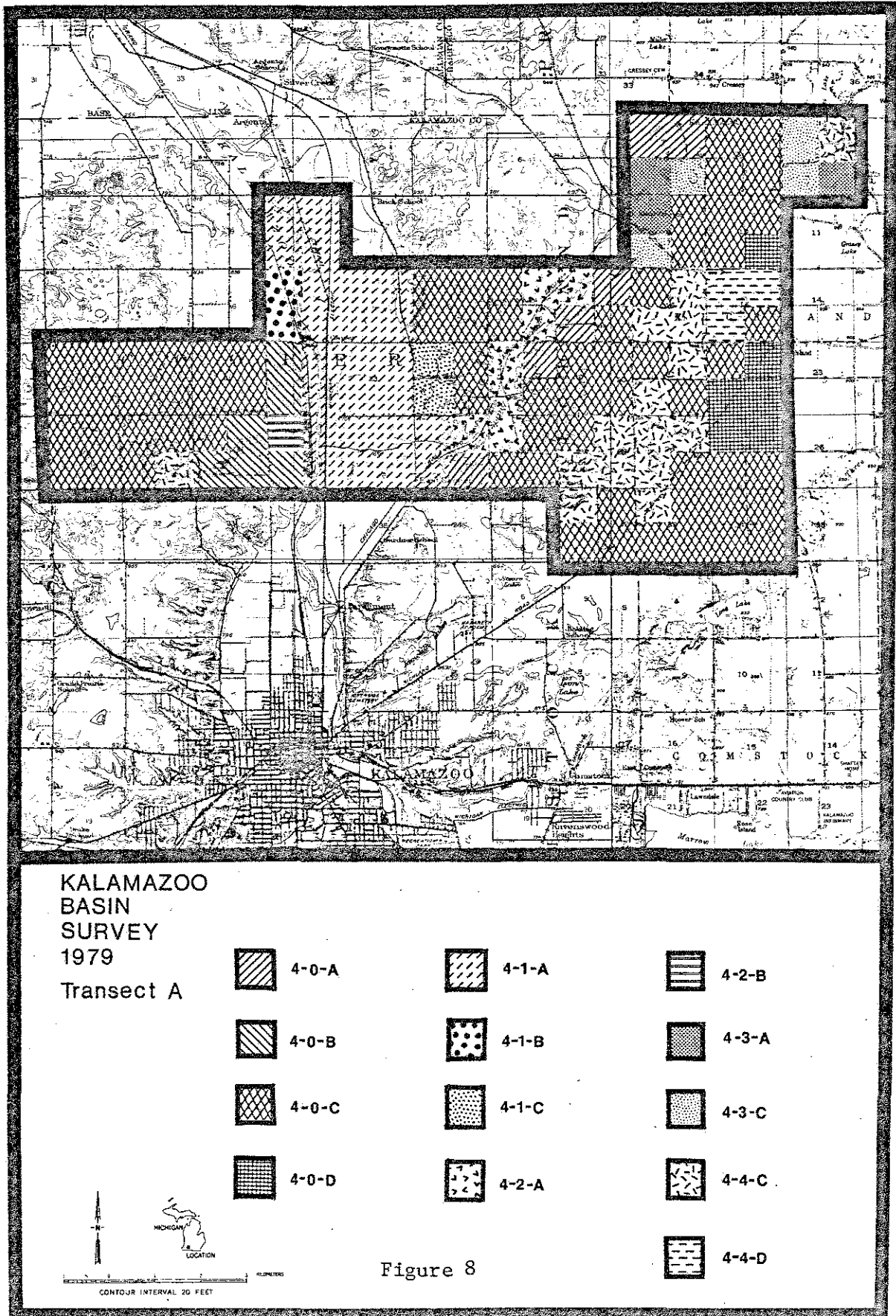
In aggregate, 13 sampling strata are recognized for Transect A (Fig. 8) and a like number for Transect B (Fig. 9) on the basis of the aforementioned criteria. For Transect A these are (with the proportion of the transect occupied by each):

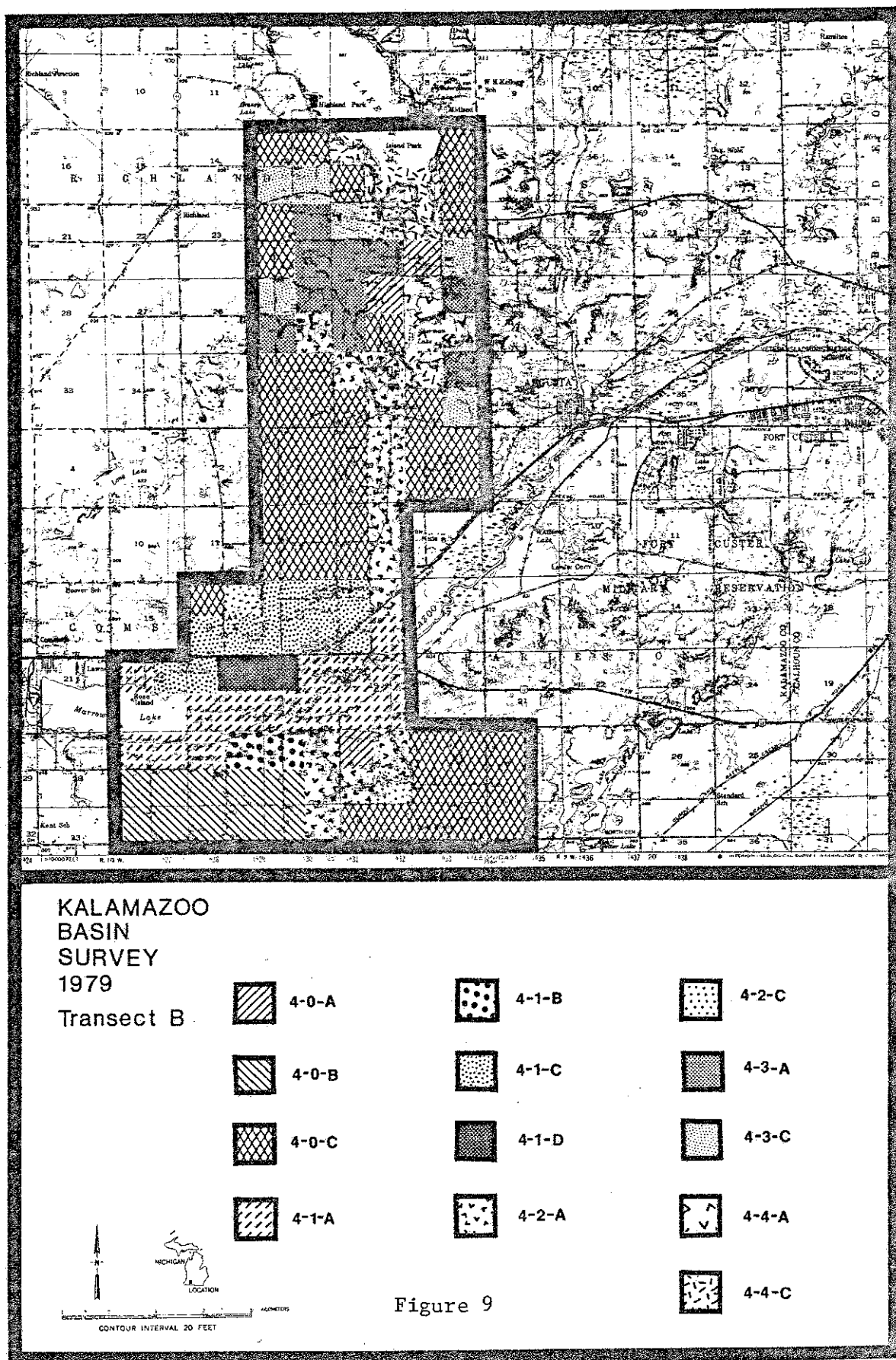
Stratum 4-0-A: This stratum consists of areas of the Kalamazoo-Oshtemo association which lack permanent streams, swamps or lakes but do support wetland vegetation. It constitutes 3.9 km^2 (4.2%) of Transect A.

Stratum 4-0-B: Same association as above, lacking permanent streams and standing bodies of water, but supporting Beech-Maple Forest. This stratum aggregates 3.9 km^2 (4.2%) of the transect.

Stratum 4-0-C: Same as above, but with Oak-Hickory Forest comprising the dominant plant association. It constitutes 42.1 km^2 (45.2%) of the transect.

Stratum 4-0-D: Same as above, but supporting prairie vegetation. This stratum comprises 3.9 km^2 (4.2%) of the transect.





- Stratum 4-1-A: This stratum consists of Kalamazoo-Oshtemo soils occurring in close proximity to the Kalamazoo River, and which supported wetland vegetation, principally seasonally inundated "heavy timber". It aggregates 15.5 km² (16.6%) of Transect A.
- Stratum 4-1-B: Same as above, but with lower water tables and/or an absence of seasonal flooding. These areas support Beech-Maple Forest. It comprises 1.3 km² (1.4%) of the transect.
- Stratum 4-1-C: Same as above, but supporting the more xerophytic Oak-Hickory Forest. This stratum also constitutes 1.3 km² (1.4%) of Transect A.
- Stratum 4-2-A: Areas of Kalamazoo-Oshtemo soils which bordered second order streams and which supported wetland vegetation. It aggregates 4.5 km² (4.8%) of the transect.
- Stratum 4-2-B: Same as above, but characterized by Beech-Maple Forest. Only .6 km² (0.6%) of the transect is assigned to this sampling stratum.
- Stratum 4-3-A: Upland swamp association, with characteristic wetland vegetation. This stratum aggregates 1.9 km² (2%) of Transect A.
- Stratum 4-3-C: Upland swamp association (probably marsh or wet prairie) amidst Oak-Hickory Forest. This stratum comprises 2.6 km² (2.8%) of the transect.
- Stratum 4-4-C: Lakes flanked by Oak-Hickory Forest. This stratum constitutes 9.7 km² (10.4%) and is found only in the eastern portion of the transect, proximal to Gull Lake and also near a series of kettle lakes located south and west of the community of Richland.

Stratum 4-4-D: This stratum distinguishes Kalamazoo-Oshtemo soils occurring in close proximity to several kettle lakes north and west of Richland. In contrast to the previous sampling stratum (4-4-C), upland areas flanking these small bodies of water formerly supported treeless, grassy plains (Gull Prairie). It aggregates 1.9 km^2 (2%) of Transect A.

For Transect B the sampling strata (together with the proportion of the transect occupied by each) are as follows:

Stratum 4-0-A: Same as described for Transect A. This stratum comprises 1.9 km^2 (2.4%) of Transect B.

Stratum 4-0-B: Same as Transect A, but aggregating 6.5 km^2 (8%) of this transect.

Stratum 4-0-C: Same as Transect A, but constituting 27.8 km^2 (34.4%) of this transect.

Stratum 4-1-A: Same as Transect A, but here comprising 9.1 km^2 (11.2%) of the sampling universe.

Stratum 4-1-B: Same as Transect A, but constituting 1.3 km^2 (1.3%) of this transect.

Stratum 4-1-C: Same as Transect A, but aggregating 6.5 km^2 (8%) of Transect B.

Stratum 4-1-D: An area of Kalamazoo-Oshtemo soils bordering the Kalamazoo River and supporting prairie vegetation. This stratum comprises a mere 1.3 km^2 (1.6%) and represents the area referred to as Toland's Prairie in Comstock Township.

Stratum 4-2-A: Same as Transect A, but constituting 9.1 km^2 (11.2%) of this transect.

Stratum 4-2-C: This stratum consists of areas of Kalamazoo-Oshtemo soils which border second order streams and support climax Oak-Hickory Forest. It comprises 1.9 km^2 (2.4%) of the transect.

Stratum 4-3-A: Same as Transect A, but aggregating 6.5 km^2 (8%) of this transect.

Stratum 4-3-C: Same as Transect A, but comprising 3.8 km^2 (4.8%) of Transect B.

Stratum 4-4-A: Areas of Kalamazoo-Oshtemo soils bordering lakes and supporting wetland vegetation. This stratum aggregates 1.9 km^2 (2.4%) of this transect.

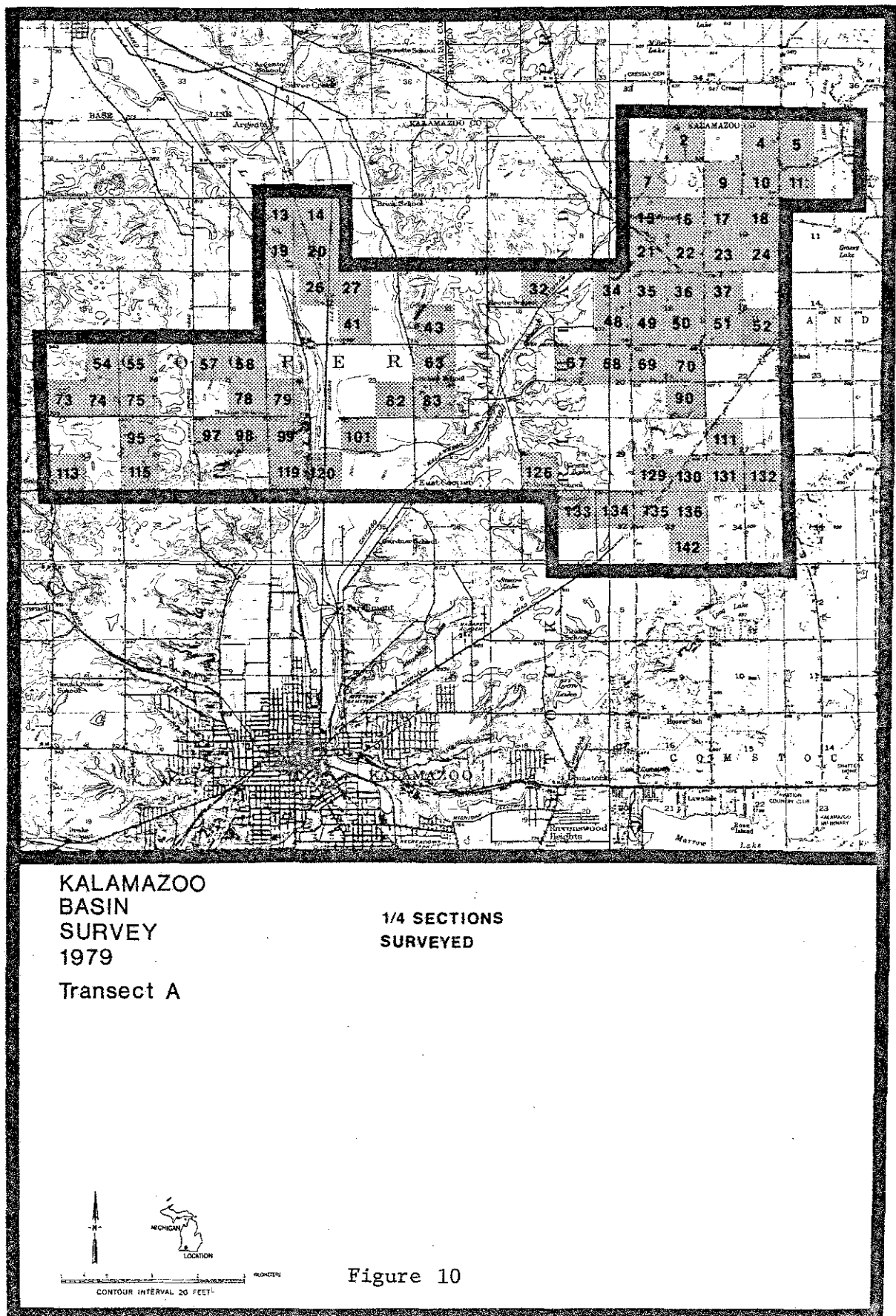
Stratum 4-4-C: Same as Transect A, but in this instance constituting only 3.2 km^2 (4%) of the transect.

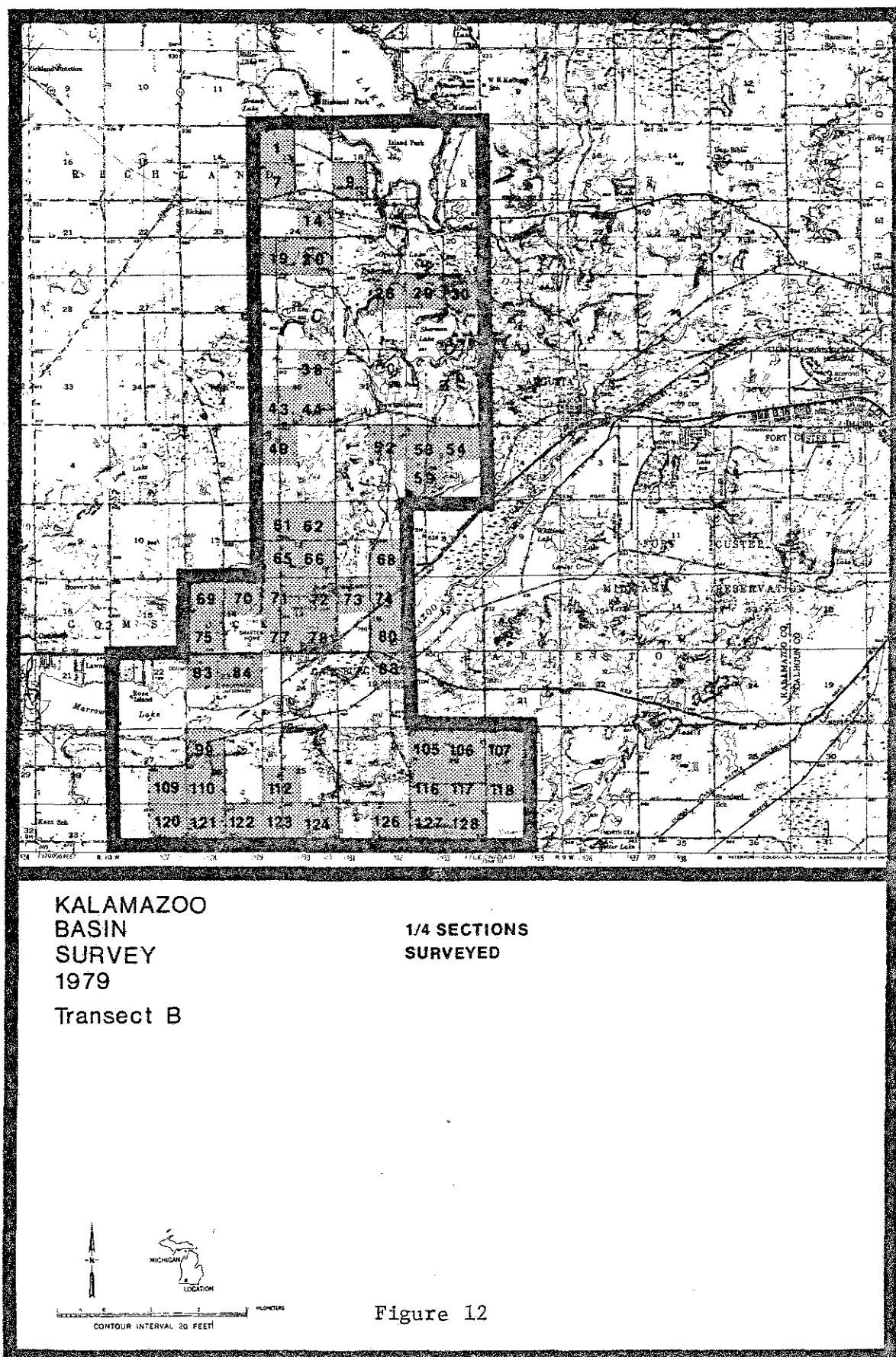
Following Lovis (1976), the quarter-section (64.75 ha) has been established as the unit of area by which the survey transects would be sampled. Initially, a 40% stratified random sample of all quarter-sections occurring within each transect was generated. However, the number of units investigated in both transects actually exceeds the number originally targeted for evaluation. Survey teams seldom had the opportunity to evaluate 100% of a targeted unit, and in order to increase our coverage, we unhesitatingly investigated units in addition to those originally targeted. These "back-up" units were also selected through use of a table of random numbers. Therefore, our coverage in one sense of the word consistently exceeds that called for by the research design. However, on the other hand, our attempts to sample 40% of that area included within each of the transects have not met with success. As in past years, our research design proved

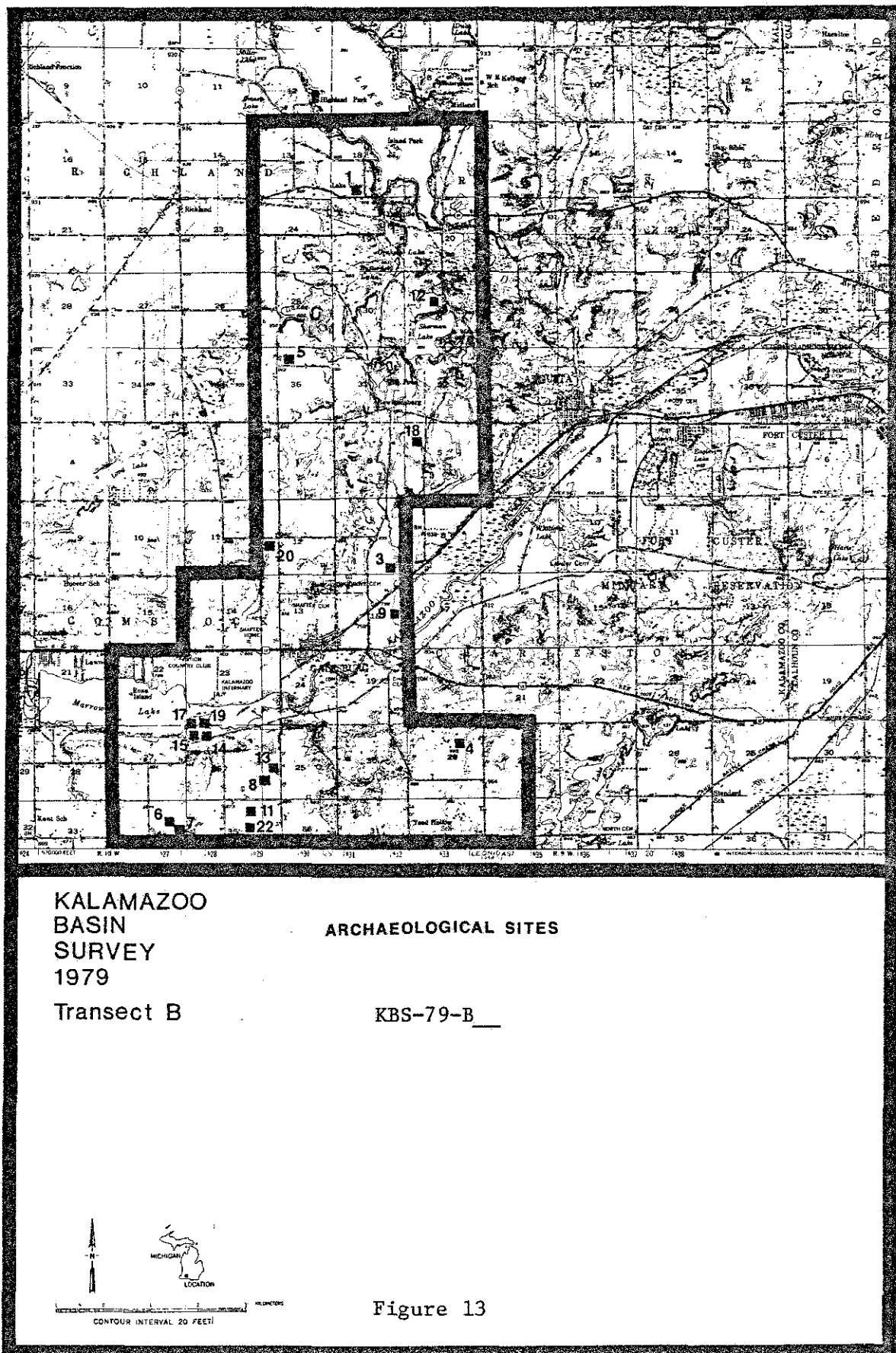
somewhat ambitious when it came to actual implementation during the field phase of the project.

In Transect A, 61 of 144 quarter-sections were targeted for investigation. However, during the course of fieldwork the survey team working in this transect actually visited a total of 70 units, or 48.6% of the total (Fig. 10). Of 39.5 km² included within the sample, more than 22.2 km² (56.2%) were intensively surveyed, with coverage by stratum ranging from 0.0% to 145.1%, or 50.1% on the average. In actuality, 22.2 km² represents 23.6% of the total area included within Transect A. And our coverage in this transect is the best recorded since the inception of KBS in 1976. Surveyor coverage in Transect A by stratum and random sampling unit is summarized in Table 1. For our efforts we realize an addition of 11 sites (Fig. 11) to the 7 which had been previously recorded for this transect.

In Transect B, 51 of 129 quarter-sections were selected for intensive pedestrian survey. Here, surveyors visited 53 units prior to termination of fieldwork, or 42.4% of those units which were accessible to the team (Fig. 12). Of 33.0 km² included within this sample, only 11.7 km² (35.4%) were investigated, with coverage by stratum ranging between 0.0% and 68.0%, or 23.6% on the average. In Transect B, systematic survey efforts were hindered by the absence of large parcels of open ground where our field procedures might be most profitably employed. Moreover, a disproportionate amount of time was spent interviewing landowners and collectors seeking leads to the locations of sites, both new and previously recorded. Table 2 provides information on surveyor coverage in this transect. The team investigating Transect B reported 18 new sites (Fig. 13), bringing the total now known to occur in this area to 25 sites.







B. Field Procedures

Each of the 1979 transects was investigated in the same fashion, with the respective survey teams concentrating on gaining access to randomly selected parcels of land with good surface visibility. In those situations where current land-use practices reflected agricultural activities and cultivated fields were available for evaluation, surveyors formed a line at one end of the field with individuals spaced at 25 m intervals. The team then moved through the area following the furrows in a zig-zag manner. Each person was instructed to first walk 10 paces to the left at a 45° angle to the line of movement, and then back to the right across the line of movement at an angle of 90° for 20 paces. The team maintained this pattern of movement until every surveyor reached the far end of the field, at which point the team shifted 25 m beyond the person at the end of the line and commenced movement in the opposite direction. This procedure was repeated until an entire parcel had been thoroughly surveyed for archaeological materials and/or features.

In more restricted areas and on landforms lacking good, continuous surface visibility, systematic coverage was not possible. In these situations the team members were instructed to disperse over the parcel of land seeking erosional features and areas of sparse vegetative cover which could be evaluated. In addition, some use was made of tubular soil samplers to probe beneath the surface in likely areas of low surface visibility. In the event that a surveyor encountered cultural debris while walking an area, the entire team assembled in this locale in order to precisely delimit the extent of scatter and recover any diagnostic materials which might be present.

Following completion of each sampling unit, the team members discussed

with the field supervisor any significant findings or observations and appropriate entries were made in the daily log. The log entries commonly reference the local topography, drainage pattern, vegetative cover, sites discovered, the number of hectares covered and any problems which were encountered that might adversely affect the quality of our data. In the event that the survey team recorded a site, a specially prepared form was completed, including a sketch map of the site area. In addition to our procedures for recovering and recording new sites in the field, surveyors also gathered information about collector sites (which were visited whenever possible), and private collections of artifacts from these sites were photographed and documented.

C. Curation of Cultural Materials

All artifactual material collected during survey was examined, cleaned and accessioned into the archaeological collections housed in the Department of Anthropology. An inventory of the contents of surface collection bags was recorded on the site forms initially prepared in the field upon discovery of the site. All relevant data about each site were then entered on the form utilized by the University of Michigan, and at this time local site numbers (KBS-79-) were changed to reflect the numbering system used by the State. Following completion of all forms, the catalogued materials were placed in the collections for future reference and study.

Table 1: Survey Coverage of Transect A by Stratum and
Random Sampling Unit ($\frac{1}{4}$ Section or 64.75 ha)

Stratum 4-0-A: N = 6 (3 targeted) Objective - 194 ha

| <u>RS#</u> | <u>Coverage</u> | |
|------------|-----------------|------------------|
| 2 | 58 | |
| <u>34</u> | <u>16</u> | |
| 2 | 74 ha | Achieved - 38.1% |

Stratum 4-0-B: N = 6 (3 targeted) Objective - 194 ha

| <u>RS#</u> | <u>Coverage</u> | |
|------------|-----------------|------------------|
| 78 | 30 | |
| 79 | 10 | |
| <u>119</u> | <u>55</u> | |
| 3 | 95 ha | Achieved - 48.9% |

Stratum 4-0-C: N = 65 (26 targeted) Objective - 1683 ha

| <u>RS#</u> | <u>Coverage</u> |
|------------|-----------------|
| 4 | 58 |
| 9 | 30 |
| 10 | 20 |
| 16 | 20 |
| 17 | 60 |
| 18 | 53 |
| 22 | 45 |
| 23 | 64 |
| 35 | 50 |
| 43 | 7 |
| 48 | 35 |
| 52 | 10 |
| 54 | 40 |
| 55 | 30 |
| 57 | 50 |
| 58 | 58 |
| 67 | 25 |
| 68 | 49 |
| 69 | 8 |
| 73 | 10 |
| 74 | 40 |
| 75 | 40 |
| 78 | 25 |
| 90 | 45 |
| 95 | 50 |
| 97 | 50 |
| 113 | 10 |
| 115 | 30 |
| 126 | 15 |

130
131
132
134
136
142
35

60
20
8
55
65
16
1,251 ha

Achieved - 74.3%

Stratum 4-0-D:

N = 6 (3 targeted)

Objective - 194 ha

RS#

Coverage

24
111
2

25
20
45 ha

Achieved - 23.2%

Stratum 4-1-A:

N = 24 (10 targeted)

Objective - 648 ha

RS#

Coverage

13
14
19
20
26
27
41
82
101
120
10

35
50
10
30
25
30
15
10
6
15
226 ha

Achieved - 34.9%

Stratum 4-1-B:

N = 2 (1 targeted)

Objective - 65 ha

RS#

Coverage

-

--

Achieved - 0%

Stratum 4-1-C:

N = 2 (1 targeted)

Objective - 65 ha

RS#

Coverage

63
83
2

12
10
22 ha

Achieved - 34%

Objective - 194 ha

Achieved - 8%

Objective 65 ha

Achieved - 38.6%

Objective - 65 ha

Achieved - 77.2%

Objective - 130 ha

Achieved - 69.5%

Objective 389 ha

Achieved - 59.7%

Stratum 4-4-D:

N = 3 (1 targeted)

Objective - 65 ha

RS#Coverage

37

54

5140

2

94 ha

Achieved - 145.1%

Totals:

Sampling Universe

144 quarter sections

Targeted Units

61 quarter sections (3,950 ha)

Surveyed Units

70 quarter sections, with coverage of 2,220 ha
(56.2%)**Summary by Stratum**

| | |
|----------------|-------------------------------------|
| Stratum 4-0-A: | 2 quarter sections/74 ha (38.1%) |
| Stratum 4-0-B: | 3 quarter sections/95 ha (48.9%) |
| Stratum 4-0-C: | 35 quarter sections/1251 ha (74.3%) |
| Stratum 4-0-D: | 2 quarter sections/45 ha (23.2%) |
| Stratum 4-1-A: | 10 quarter sections/226 ha (34.9%) |
| Stratum 4-1-B: | 0 quarter sections/0 ha (0%) |
| Stratum 4-1-C: | 2 quarter sections/22 ha (34%) |
| Stratum 4-2-A: | 1 quarter sections/16 ha (8%) |
| Stratum 4-2-B: | 1 quarter sections/25 ha (38.6%) |
| Stratum 4-3-A: | 2 quarter sections/50 ha (77.2%) |
| Stratum 4-3-C: | 3 quarter sections/90 ha (69.5%) |
| Stratum 4-4-C: | 7 quarter sections/232 ha (59.7%) |
| Stratum 4-4-D: | 2 quarter sections/94 ha (145.1%) |

Average coverage for 13 sampling strata = 50.1% of land in sample from each stratum.

Table 2: Survey Coverage of Transect B by Stratum and
Random Sampling Unit ($\frac{1}{4}$ Section or 64.75 ha)

Stratum 4-0-A: N = 3 (1 targeted) Objective - 65 ha

| <u>RS #</u> | <u>Coverage</u> | |
|-------------|-----------------|-----------------|
| <u>28</u> | <u>6</u> | |
| 1 | 6 ha | Achieved - 9.4% |

Stratum 4-0-B: N = 10 (4 targeted) Objective - 259 ha

| <u>RS #</u> | <u>Coverage</u> | |
|-------------|-----------------|----------------|
| 109 | 24 | |
| 110 | 5 | |
| 112 | 16 | |
| 120 | 14 | |
| 121 | 5 | |
| 122 | 59 | |
| <u>123</u> | <u>53</u> | |
| 7 | 176 ha | Achieved - 68% |

Stratum 4-0-C: N = 42 (17 targeted) Objective - 1101 ha

| <u>RS #</u> | <u>Coverage</u> | |
|-------------|-----------------|------------------|
| 1 | 41 | |
| 9 | 38 | |
| 19 | 38 | |
| 38 | 16 | |
| 43 | 16 | |
| 44 | 40 | |
| 49 | 8 | |
| 53 | 57 | |
| 54 | 53 | |
| 59 | 18 | |
| 61 | 12 | |
| 62 | 10 | |
| 65 | 6 | |
| 66 | 6 | |
| 69 | 6 | |
| 105 | 16 | |
| 106 | 16 | |
| 107 | 26 | |
| 116 | 18 | |
| 117 | 45 | |
| 118 | 41 | |
| 126 | 28 | |
| 127 | 49 | |
| <u>128</u> | <u>61</u> | |
| 24 | 665 ha | Achieved - 60.5% |

Stratum 4-2-C: N = 3 (1 targeted) Objective - 65 ha

RS#

Coverage

70
1

8
8 ha

Achieved - 12.5%

Stratum 4-3-A: N = 10 (4 targeted) Objective - 259 ha

RS#

Coverage

14
20
30
3

6
14
16
36 ha

Achieved - 14.1%

Stratum 4-3-C: N = 6 (3 targeted) Objective - 194 ha

RS#

Coverage

7
1

26
26 ha

Achieved - 13.5%

Stratum 4-4-A: N = 3 (1 targeted) Objective 65 ha

RS#

Coverage

29
1

8
8 ha

Achieved - 12.5%

Stratum 4-4-C: N = 5 (2 targeted) Objective - 130 ha

RS#

Coverage

-

--

Achieved - 0%

Totals:

Sampling Universe
Targeted Units
Surveyed Units

129 quarter sections
51 quarter sections (3,302 ha)
53 quarter sections, with coverage of 1,171 ha
(35.4%)

Summary by Stratum

| | |
|---------------|------------------------------------|
| Stratum 4-0-A | 1 quarter section/6 ha (9.4%) |
| Stratum 4-0-B | 7 quarter sections/176 ha (68%) |
| Stratum 4-0-C | 24 quarter sections/665 ha (60.5%) |
| Stratum 4-1-A | 3 quarter sections/50 ha (12.7%) |
| Stratum 4-1-B | 0 quarter sections/0 ha (0%) |
| Stratum 4-1-C | 7 quarter sections/68 ha (26.6%) |
| Stratum 4-1-D | 1 quarter section/34 ha (53.1%) |
| Stratum 4-2-A | 4 quarter sections/94 ha (24.4%) |
| Stratum 4-2-C | 1 quarter section/8 ha (12.5%) |
| Stratum 4-3-A | 3 quarter sections/36 ha (14.1%) |
| Stratum 4-3-C | 1 quarter section/26 ha (13.5%) |
| Stratum 4-4-A | 1 quarter section/8 ha (12.5%) |
| Stratum 4-4-C | 0 quarter sections/0 ha (0%) |

Average coverage for 13 sampling strata = 23.6% of land in sample from each stratum.

5. Description of Sites Recorded and Catalog of Surface Collections

With respect to the following site descriptions, an assessment is made regarding each site's relative significance. That is, a "low, moderate, or high priority" is assigned to each site reflecting its potential interpretive value to Western Michigan University's current research goals which are: (1) to erect a cultural chronology, and (2) delineate prehistoric land use patterns in the Kalamazoo River Valley.

A. Sites in Transect A¹

- KBS-79-A1
20 Kz 71 Williams. Possible campsite in the S 1/2, NW 1/4, NW 1/4 of Section 2, Richland Township, T1S R10W, Kalamazoo County, Michigan. Several isolated stone artifacts found along a ridge overlooking an old pond, approximately 700 m west of Little Long Lake. Low priority.
1 side notched projectile point - WMU collection
1 stemmed projectile point and 1 ground stone adze - Marilyn N. Williams collection.
- KBS-79-A2
20 Kz 72 Hamilton. Possible campsite in the S 1/2, NW 1/4, SW 1/4 of Section 4, Richland Township, T1S R10W, Kalamazoo County, Michigan. Approximately 200 m² of lithic scatter 400 m west of a small unnamed pond. Low priority.
1 corner - notched projectile point
11 flint chips
- KBS-79-A3*
20 Kz 73 Byrne. Informant site in the NW 1/4, SE 1/4, NW 1/4 of Section 6, Kalamazoo Township, T2S R11W, Kalamazoo County, Michigan. Five flint bifaces found along several sandy, gravelly knolls overlooking a marsh approximately 1.5 km southeast of Twin Lakes. Low priority.
1 stemmed projectile point and
4 flint bifaces - Robert Engstrom collection
- KBS-79-A4
20 Kz 74 James. Isolated projectile point found in the NW 1/4, SE 1/4, NW 1/4, Section 20, Cooper Township, T1S R11W, Kalamazoo County, Michigan. Low priority.
1 serrated corner - notched projectile point

¹. Asterisked (*) sites are informant sites which are not shown on the archaeological site map for Transect A, but rather, are indicated on the maps included in Appendix I.

- KBS-79-A5
20 Kz 75
Scofield. Isolated projectile point found in the SW 1/4, NE 1/4, SW 1/4, Section 27, Cooper Township, T1S R11W, Kalamazoo County, Michigan. Site located approximately 600 m west of the Kalamazoo River. Low priority.
1 lanceolate projectile point
- KBS-79-A6
20 Kz 76
Kalamazoo Nature Center. Isolated projectile point found in the NW 1/2, SW 1/4, SW 1/4, Section 22, Cooper Township, T1S R11W, Kalamazoo County, Michigan. Site located approximately 1 km west of the Kalamazoo River. Low priority.
1 side notched projectile point
- KBS-79-A7
20 Kz 77
Boudeman. Informant site. Numerous projectile points found scattered over the S 1/2, Section 3 and E 1/2, Section 10, Cooper Township, T1S R11W, Kalamazoo County, Michigan. Site located immediately east of the Kalamazoo River. Moderate to low priority.
19 stemmed, notched and triangular projectile points found by Mr. Louis Klein over a 20 year period - Louis Klein collection.
- KBS-79-A8
20 Kz 78
Klein. Informant site. Isolated projectile points found in the SW 1/4, SW 1/4, NE 1/4, Section 10, Cooper Township, T1S R11W, Kalamazoo County, Michigan. Found along sandy ridges about .25 km east of the Kalamazoo River. Low priority.
2 notched projectile points - Louis Klein collection
- KBS-79-A9
20 Kz 79
Hoffa. Isolated projectile point found in the SW 1/4, SE 1/4, SE 1/4 of Section 23, Cooper Township, T1S R11W, Kalamazoo County, Michigan. Site located 1.6 km east of the Kalamazoo River. Low priority.
1 corner notched projectile point
- KBS-79-A10
20 Kz 80
Schau. Informant site. Isolated projectile point found in the E 1/2, NW 1/4, NW 1/4, and W 1/2, SE 1/4, NW 1/4, Section 24, Cooper Township, T1S R11W, Kalamazoo County, Michigan. Site located 2.4 km east of the Kalamazoo River. Low priority.
1 side notched projectile point (and others now missing)
- Mr. Schau's collection.
- KBS-79-A11
20 Kz 81
Force. Isolated projectile point found in the SE 1/4, SW 1/4, SE 1/4, Section 21, Richland Township, T1S R10W, Kalamazoo County, Michigan. Low priority.
1 expanding stem projectile point
- KBS-79-A12
20 Kz 82
Wendzel. Isolated projectile point found in the SW 1/4, NW 1/4, SE 1/4 of Section 17, Richland Township, T1S R10W, Kalamazoo County, Michigan. Low priority.
1 corner notched projectile point

KBS-79-A13*
20 Kz 83

Schmidtke. Informant site. Small campsite of probable Paleo-Indian affiliation located in the center of the N 1/2, SW 1/4, Section 36, Prairie Ronde Township, T4S R12W, Kalamazoo County, Michigan and extending into NW 1/4, NE 1/4, NW 1/4, Section 1, Flowerfield Township, St. Joseph County, Michigan. Low to moderate priority.

- 1 corner notched projectile point
- 1 stemmed projectile point
- 1 expanding stem projectile point
- 1 fluted "Clovis-like" projectile point - Schmidtke collection

KBS-79-A14*
20 Kz 84

Rhoda. Informant site. Isolated projectile point and retouched uniface found in the SE 1/4, NW 1/4, Section 23, Prairie Ronde Township, T4S R12W, Kalamazoo County, Michigan. Probable Archaic affiliation. Low priority.

- 1 stemmed projectile point and
- 1 retouched unifacial blade - Schmidtke collection

KBS-79-A15*
20 Kz 85

Martin. Informant site. Isolated projectile point found in Flowerfield Creek, SE 1/4, NW 1/4, Section 36, Prairie Ronde Township, T4S R12W, Kalamazoo County, Michigan. Probable Archaic affiliation. Low priority.

- 1 corner notched projectile point - Schmidtke collection

KBS-79-A16*
20 Kz 86

Landis. Informant site. Isolated projectile point found in the NW 1/4, NE 1/4, Section 36, Prairie Ronde Township, T4S R12W, Kalamazoo County, Michigan. Low priority.

- 1 corner notched projectile point - Schmidtke collection

KBS-79-A17*
20 Kz 87

Cartwright Farm. Informant site. Isolated Paleo-Indian projectile point found in the S 1/2, SE 1/4, Section 36, Brady Township, T4S R10W, Kalamazoo County, Michigan. Low priority.

- 1 "fluted" projectile point - Louis Klein collection

B. Sites in Transect B

- KBS-79-B1
20 Kz 88 Pinkney. Isolated projectile point found in the SE 1/4, SE 1/4, SW 1/4, Section 18, Ross Township T1S R9W, Kalamazoo County, Michigan. This site is located in a slightly rolling, rocky corn stubble field approximately 800 m southwest of Gull Lake. Low priority.
1 side notched projectile point
- KBS-79-B3
20 Kz 89 Roelof. Small campsite found in the SW 1/4, SE 1/4, SE 1/4, Section 7, Charleston Township, T2S R9W, Kalamazoo County, Michigan. This site is located in a flat heavily eroded field about 90 m west of Gull Creek. A light scatter of lithic debris and fire-cracked rock covers an area of about 10 m². Low priority.
1 stemmed projectile point base
3 flint chips
- KBS-79-B4
20 Kz 90 VanVranken. Isolated projectile point found in the SW 1/4, NW 1/4, NE 1/4, Section 29, Charleston Township, T2S R9W, Kalamazoo County, Michigan. This site is located in a rolling cultivated field approximately 200 m southeast of a small pond. Low priority.
1 stemmed projectile point
2 flint chips
- KBS-79-B5
20 Kz 91 Campbell. Informant site. Possible village found in the NE 1/4, NW 1/4, Section 36, Richland Township, T1S R10W, Kalamazoo County, Michigan. Numerous lithic artifacts have been found by the Campbell family on their 200 acre farm located approximately 800 m south-southeast of Three Lakes. No additional cultural material was observed during WMU's investigation. Moderate priority.
- KBS-79-B6
20 Kz 92 Mezo I. Small camp found in the center, SE 1/4, NE 1/4, Section 34, Comstock Township, T2S R10W, Kalamazoo County, Michigan. This site is located approximately 2 km south of Morrow Lake in a gently rolling cultivated field. A light scatter of lithic debris covers an area of about 5 m². Low priority.
1 biface
6 flint chips
- KBS-79-B7
20 Kz 93 Mezo II. Light lithic scatter covering an area of about 10 m² in the SE 1/4, SE 1/4, NE 1/4, Section 34, Comstock Township, T2S R10W, Kalamazoo County, Michigan. This site is located in a gently rolling cultivated field approximately 2 km south of Morrow Lake. Low priority.
21 flint chips

- KBS-79-B8
20 Kz 94
Moleski. Very light lithic scatter over an area of about 10 m² in the SE 1/4, NW 1/4, SW 1/4, Section 25, Comstock Township, T2S R10W, Kalamazoo County, Michigan. This site is situated in a relatively level cultivated field about 1.6 km south of Morrow Lake. Low priority.
3 flint chips
- KBS-79-B9
20 Kz 95
Drobny I. Isolated projectile point found in the SE 1/4, SE 1/4, NE 1/4, Section 18, Charleston Township, T2S R9W, Kalamazoo County, Michigan. This site is located on level terrain in a cultivated field approximately 600 m east of Gull Creek. Low priority.
1 side notched projectile point
- KBS-79-B11
20 Kz 96
Rice I. Isolated triangular projectile point found in the NE 1/4, NE 1/4, NE 1/4, Section 35, Comstock Township, T2S R10W, Kalamazoo County, Michigan. This site is located 1.6 km south of Morrow Lake in a flat, poorly drained cultivated field. Low priority.
1 triangular projectile point base
- KBS-79-B12
20 Kz 97
Precipitation. Isolated projectile point found in the NE 1/4, SE 1/4, NW 1/4, Section 29, Ross Township, T1S R9W, Kalamazoo County, Michigan. This site is located in a gently rolling cultivated field about 400 m north of Sherman Lake. Low priority.
1 side notched projectile point
- KBS-79-B13
20 Kz 98
Perkins. Isolated projectile point found in the NE 1/4, NW 1/4, SW 1/4, Section 25, Comstock Township, T2S R10W, Kalamazoo County, Michigan. This site is situated about 1.6 km south of Morrow Lake in an alfalfa field. Low priority.
1 stemmed projectile point
- KBS-79-B14
20 Kz 99
VanEngen I. Very light lithic scatter covering an area of about 10 m² in the SE 1/4, NW 1/4, NW 1/4, Section 26, Comstock Township, T2S R10W, Kalamazoo County, Michigan. This site is located in a relatively level cultivated field approximately 250 m south of the Kalamazoo River. Low priority.
7 flint chips
- KBS-79-B15
20 Kz 100
Tulip. Isolated biface and flint chip found in the NW 1/4, NW 1/4, NW 1/4, Section 26, Comstock Township, T2S R10W, Kalamazoo County, Michigan. This site is located in a cultivated field 800 m south of the Kalamazoo River. Low priority.
1 biface
1 flint chip

- KBS-79-B17
20 Kz 101 Tomahawk. Small camp located in the NE 1/4, NW 1/4, NW 1/4, Section 26, Comstock Township, T2S R10W, Kalamazoo County, Michigan. A very light scatter of lithic debris covering an area of about 20 m² and located 50 m south of the Kalamazoo River. Low priority.
1 side notched projectile point (quartz)
4 flint chips
- KBS-79-B18
20 Kz 102 Pope. Isolated projectile point found in the NE 1/4, SW 1/4, NW 1/4, Section 5, Charleston Township, T2S R9W, Kalamazoo County, Michigan. This site is located in a gently rolling, cultivated field approximately 1.6 km east of Gull Creek. Low priority.
1 corner notched projectile point
- KBS-79-B19
20 Kz 103 VanEngen II. Small camp found in the NW 1/4, NE 1/4, NW 1/4, Section 26, Comstock Township, T2S R10W, Kalamazoo County, Michigan. A very light scatter of lithic debris covering an area of about 20 m² in a level cultivated field approximately 150 m south of the Kalamazoo River. Low priority.
1 projectile point fragment
4 flint chips
- KBS-79-B20
20 Kz 104 Drobny II. Isolated projectile point found in the NW 1/4, NW 1/4, SW 1/4, Section 12, Comstock Township, T2S R10W, Kalamazoo County, Michigan. This site is located in a gently rolling, cultivated field about 800 m northeast of an unnamed creek. Low priority.
1 triangular projectile point base
- KBS-79-B22
20 Kz 105 Schug. Isolated scraper found in the SW 1/4, SE 1/4, NE 1/4, Section 35, Comstock Township, T2S R10W, Kalamazoo County, Michigan. This site is located in a level cultivated field approximately 2.4 km south of Morrow Lake. Low priority.
1 stemmed scraper

6. Interpretations and Conclusions

Our findings this year are not difficult to summarize, but interpreting the data derived from the 35 new sites located by KBS is no easy matter. As in past years, a major problem for the analyst stems from the fact that surface collections acquired through survey seldom contain significant quantities of cultural material and few if any diagnostic artifacts. Be that as it may, the information recorded for those portions of Kalamazoo County visited by the survey teams during 6 field weeks clearly indicates that humans have been present in the county since Paleo-Indian times (ca. 10,000-12,000 B.P.).

First, with respect to the 6 informant sites which occur outside the 1979 transects (see maps in Appendix I for their precise locations), it would appear that Prairie Ronde Township deserves our future consideration. We are much intrigued by the several Paleo-Indian artifacts observed in private collections and subsequently recovered from the surface during our limited evaluation of portions of the Flowerfield Creek drainage (specifically site KBS-79-A13). Moreover, our visit to the Schmidtke property along the Kalamazoo-St. Joseph county line was instrumental in our acquiring additional information regarding another Paleo-Indian site (KBS-79-A17) located along the southern boundary of Kalamazoo County (and in the St. Joseph River Basin rather than the Kalamazoo drainage), but in this instance situated on a parcel of land located several townships to the east of the Schmidtke property. No site of clearly Paleo-Indian affiliation was recorded for either of the 1979 transects.

As was the case in previous years, the vast majority of sites located in the 1979 project area indicate extensive rather than intensive occupation of the Middle Kalamazoo River Valley in prehistory. Of 11 new sites recorded

for Transect A (Fig. 11), 9 are isolated or "spot" finds, one is a light lithic scatter occupying about 200 m², and the Boudeman site (KBS-79-A7) appears to represent a habitation area (i.e. component) of undetermined extent. In Transect B (Fig. 13), 18 sites were recorded, including 10 isolated finds, 7 light scatters of lithic debris ranging in size from about 5-20 m², and one probable component. This latter site, Campbell (KBS-79-B5), could not be precisely delineated by surveyors due to the vegetative cover at the time of our visit. However, several flakes were encountered on the surface in the general vicinity of numerous finds of artifacts by the landowner. The Campbell family has a very large and impressive collection of artifacts which they insist were all recovered from the recorded location of the site (see Plates). Only more thorough reconnaissance of the site area, together with some subsurface testing, will further elucidate the size and potential significance of this site.

On the basis of the kinds and quantities of debris recovered and the location and size of the sites, themselves, together with comparisons drawn from prior surveys conducted in areas downstream from the 1979 project (Cremin 1978b), we strongly suggest that this portion of the Middle Kalamazoo Valley was occupied in conjunction with seasonal movements undertaken to exploit natural resources which could be most efficiently procured by small work parties. The activities suggested by the data available to us in all probability range from isolated episodes of hunting upland game during which projectiles were occasionally lost or discarded to short-term collecting camps where specific maintenance and/or extractive tasks were performed. The dispersed pattern of settlement indicated by the 1979 data set is similar to that noted for the 1978 survey (Cremin and Marek 1978), and would also appear to stand in marked contrast to the body of data derived from our prior work in the lower valley, specifically the 1976 transect (see Cremin 1978b, and also Garland and Kingsley 1979). The survey data from the

lower valley, supplemented by some excellent information derived through test excavations undertaken at a number of sites in this area, strongly suggest that subsistence activities and settlement decisions characterizing the occupation of this portion of the valley reflect seasonal procurement of resources which were concentrated in the aquatic and riparian habitats bordering the main river and the lower course of major streams tributary to it (Cremin 1978b). This is particularly evident for the late prehistoric period and those groups referred to as Upper Mississippian.

Referring to those 38 sites (both previously known and recently recorded) which occur in surveyed portions of the 1979 project area, we have recorded one site for every 148 hectares surveyed in Transect A and one site per 51 ha in Transect B. The combined average for both transects is one site per 89 ha; a figure which does not compare very favorably with either the 1977 transect (one site per 23 ha evaluated) or the combined average for the 1978 transects (one site per 24 ha surveyed). Although ground surface visibility and access to large, contiguous parcels of cultivated land were generally much improved this year and survey methods were virtually identical to those employed in previous years, surveyors had to walk almost 4 times as much ground to find a site as had been the case in 1977 and 1978! We interpret this observation to reflect the continued decline in site density as one proceeds upstream from the lake shore toward the headwaters of the Kalamazoo River.

Table 3 summarizes site density data for both transects by individual sampling stratum. In calculating site density, all 38 previously known and recently recorded sites occurring in surveyed portions of the 2 transects are utilized. Combining site density data for both transects results in a mean density of 2.18. This is less than 1/4 of the site density recorded during our survey of the 1976 transect located near the confluence of the Kalamazoo and Rabbit rivers in the lower valley, less than 1/2 the site density noted for our 1977 transect situated immediately below Lake Allegan

Table 3: Site Density per Km^2 (Calculated by Dividing the Number of Sites by the actual Km^2 Surveyed) for Transects A and B by Sampling Stratum.

| Stratum: | Transect A | Transect B |
|-----------|------------------|------------------|
| 4-0-A | 1.35 | 0.00 |
| 4-0-B | 2.11 | 3.41 |
| 4-0-C | 0.24 | 0.75 |
| 4-0-D | 0.00 | |
| 4-1-A | 3.10 | 14.00 |
| 4-1-B | | |
| 4-1-C | 4.55 | 2.94 |
| 4-1-D | | 2.94 |
| 4-2-A | 0.00 | 1.06 |
| 4-2-B | 0.00 | |
| 4-2-C | | 0.00 |
| 4-3-A | 0.00 | 0.00 |
| 4-3-C | 1.11 | 0.00 |
| 4-4-A | | 12.50 |
| 4-4-C | 0.00 | |
| 4-4-D | 0.00 | |
| <hr/> | | |
| 16 Strata | 12.46 | 37.60 |
| | $\bar{X} = 1.04$ | $\bar{X} = 3.42$ |

and 43.6% lower than the density observed for the 1978 project located upstream from Lake Allegan (Cremin 1978b). These empirical data clearly support the aforementioned observation that the frequency with which pre-historic sites occur in the valley diminishes as one moves further upstream from the river's mouth.

Somewhat different results are obtained when individual transects are considered. As is indicated in Table 3, the site density recorded for the upstream transect, Transect B, is more than 3 times greater than the density calculated for Transect A. This observation requires explanation inasmuch as it is counter to our expectations based on the results of our prior research. It is all the more interesting given the fact that our coverage in Transect A amounted to 22.2 km^2 as compared with coverage of 11.7 km^2 for Transect B. Perhaps it is significant that fully 70% (14.65 km^2) of that portion of Transect A evaluated by the survey team consisted of strata lacking permanent

streams or other standing bodies of water. In fact, only Stratum 4-1-A and Stratum 4-1-C have produced site densities which exceed the combined average for both transects, and these strata are adjacent to the Kalamazoo River. To the contrary, strata in Transect B having high densities include 4-0-B, 4-1-A, 4-1-C, 4-1-D and 4-4-A, with the 2 most significant densities observed for the 1979 project being 4-1-A and 4-4-A.

We have noted an absence of sites for 6 of 15 sampling strata evaluated. In all 6 cases, we cannot entirely dismiss the possibility that this observation is an artifact of our research design. In aggregate, 16 quarter-sections (10.36 km^2) occurring in these strata were targeted for investigation. However, only 490 ha (47%) were surveyed prior to termination of the project. We think it significant that each of these strata which has failed to produce a site includes areas of the transects which are located at some distance from the river.

As a final point to emphasize the role of the Kalamazoo River in prehistoric site location decisions, we offer the following aggregate site densities calculated for 33.91 km^2 of the project evaluated, grouping individual strata on the basis of their association with water:

1. Strata consisting of upland areas removed from water-17sites/ 23.17 km^2
= 0.73
2. Strata proximal to the Kalamazoo River-18/4 = 4.50
3. Strata adjacent to tributary streams-1/1.43 = 0.70
4. Strata associated with upland swamps-1/2.02 = 0.50
5. Strata having upland lakes-1/3.34 = 0.30

Clearly these data indicate a strong preference on the part of the prehistoric residents of the project area to confine their activities to the immediate area of the river.

In 1979 we introduced a new criterion (plant association) into our stratification procedure. Each of the associations for which we have information on species composition and community distribution is described on pages 18-19.

Since regional biogeography can be assumed to have played an important role in prehistoric subsistence-settlement decisions, the correlation of sites with a particular plant association(s) may provide information useful in assessing site distributional data. With respect to the matter of site location in the 1979 project area, Table 3 clearly illustrates a strong correlation with strata characterized by wetland vegetation. This is especially noteworthy for sites in Transect B, where wetlands adjacent to the Kalamazoo River and bordering upland lakes yield site densities significantly higher than the average. For this same transect we also note that densities slightly higher than the average calculated for the entire project are associated with beech-maple vegetation in uplands removed from permanent sources of water and in both oak-hickory and native prairie settings along the Kalamazoo River. In Transect A, upland beech-maple areas yield a density slightly lower than the average, with the only strata yielding densities higher than the mean being wetlands flanking the river and areas of oak-hickory development proximal to the Kalamazoo.

Combining data on vegetational distribution throughout the project area we have observed the following aggregate densities:

1. Wetlands-17 sites/5.60 km² = 3.04
2. Beech-Maple Forest-8/2.96 = 2.70
3. Oak-Hickory Forest-12/23.62 = 0.51
4. Prairie-1/1.73 = 0.58

Since wetland vegetation is most prevalent along the Kalamazoo River, it is not unanticipated that, given our prior observations, this association has yielded the highest density. The main river is not only the logical artery for prehistoric transportation and communication, but it was most assuredly the most reliable source for fresh water and those plant and animal resources most readily available to the residents of the project area. That upland areas flanking the valley and supporting Beech-Maple Forest also produce an

Table 4: Occupational Intensity Values Calculated
for Sampling Strata in Transects A and B.

| Stratum: | Transect A | Transect B |
|-----------|------------------|-------------------|
| 4-0-A | 6.76 | 0.00 |
| 4-0-B | 2.11 | 10.23 |
| 4-0-C | 0.24 | 2.11 |
| 4-0-D | 0.00 | |
| 4-1-A | 23.01 | 74.00 |
| 4-1-B | | |
| 4-1-C | 4.55 | 29.41 |
| 4-1-D | | 29.41 |
| 4-2-A | 0.00 | 5.32 |
| 4-2-B | 0.00 | |
| 4-2-C | | 0.00 |
| 4-3-A | 0.00 | 0.00 |
| 4-3-C | 1.11 | 0.00 |
| 4-4-A | | 12.50 |
| 4-4-C | 0.00 | |
| 4-4-D | 0.00 | |
| <hr/> | | |
| 16 Strata | 37.78 | 162.98 |
| | $\bar{X} = 3.15$ | $\bar{X} = 14.82$ |

aggregate site density greater than the mean for the entire project suggests that resources characteristic of this association were also being regularly exploited. These areas would have provided well-drained sites for the placement of camps, and might be anticipated to have hosted human groups during the season of maple sap collection as well as those times of the year when cherries and various nuts (e.g. beechnuts, walnuts, hickory nuts) could have been harvested. Finally, our data would suggest that areas of oak-hickory and prairie vegetation were little utilized during prehistory or, alternatively, that the activities conducted in these sorts of settings were not associated with the kinds of behavior that frequently resulted in the deposition of debris which would make later definition of the presence of archaeological sites possible. The only clear exception to this statement would appear to be Stratum 4-1-C in Transect A. This area of Oak-Hickory Forest yielded the highest site density for this transect, but clearly we must attach great

significance to the fact that this stratum consists of parcels located in close proximity to the river as well!

As a means of checking the validity of our interpretations derived from site density data, we have also calculated an index of occupational intensity utilizing suggestions offered by Christopher Pebbles (personal communication). In this instance:

- 01: spot find = 1 point
- 02: lithic scatter = 5 points
- 03: component = 10 points

Table 4 lists values assigned to the various strata in both Transects A and B. Combining data from both transects results in a mean intensity score of 8.73 for the entire project. This score is 6.53 times less than the value calculated for the 1976 transect, 2.98 times less than the intensity score recorded in 1977 and almost 1/2 of the score for the transects investigated last year (Cremin 1978b). Like the data set presented earlier, calculation of this index strongly suggests less intensive utilization of this year's project than those surveyed in previous years.

With respect to individual transects, we have observed that Transect B yields an intensity score 4.7 times greater than that recorded for the downstream transect. This observation is consistent with that regarding the matter of site density. Both data sets would appear to confirm our impressions that the upstream transect offered opportunities for the pre-historic residents of the valley that were either absent or less available in the area encompassed by Transect A.

The greatest values in both transects were recorded for Stratum 4-1-A, strongly suggesting a preference for locating near wetland plant communities bordering the Kalamazoo River. The only other strata yielding values much greater than the project mean were 4-1-C and 4-1-D in Transect B. Again, the importance of the river in settlement decisions is indicated, but with

some consideration also being given to nearby oak-hickory and prairie habitats. Grouping individual strata, first with respect to the availability of water and, second, in terms of the prevalent plant association, yields the following aggregate occupational intensity scores:

1. Strata consisting of upland areas removed from water-42/23.12 = 1.82
2. Strata proximal to the Kalamazoo River-120/4 = 30.00
3. Strata adjacent to tributary streams-5/1.43 = 3.50
4. Strata associated with upland swamps-1/2.02 = 0.50
5. Strata characterized by upland lakes-1/3.34 = 0.30

-
1. Wetlands-100/5.60 = 17.86
 2. Beech-Maple Forest-20/2.96 = 6.76
 3. Oak-Hickory Forest-39/23.62 = 1.65
 4. Prairie-10/1.73 = 5.78

As these empirical data indicate, the Kalamazoo River and those wetland habitats which flank the stream shoreline are the only associations that yield occupational intensity values exceeding the average of 8.73 calculated for both transects (i.e. the entire 1979 project area). Together with site density data, this data set strongly suggests that the river valley, itself, was the focal point of prehistoric settlement in the project. Yet while the river and its adjacent wetland habitats experienced the most intensive utilization, upland areas were not totally ignored. Here, both plant and animal resources were probably exploited on a seasonal basis by small work parties operating out of small, limited activity sites. Unfortunately, the nature of the activity undertaken from these site loci and most often represented by isolated finds of projectiles and occasional scatters of lithic debris, is very difficult to ascertain from the data recovered through surface reconnaissance. And yet there is little to suggest that

careful testing will result in the recovery of information appropriate to the delineation of site function. Be that as it may, the precise nature of the activity undertaken from most of the sites recorded in the 1979 transects will only be ascertained if archaeologists and their supporting institutions undertake to systematically investigate at least a representative sample of the total population of small sites occurring within the project area.

7. Comments on Management of Cultural Resources

As in past years, sites recorded in 1979 were found either in areas under cultivation or associated with erosional features, reflecting the fact that our program is one of surface reconnaissance with only limited subsurface testing. Therefore, that portion of the landscape which is the focus of our attention, together with the archaeological context, is constantly being altered and some valuable information is being irretrievably lost. The data set for this year's project suggests that given the nature of the sites recorded little information is in actuality available for even the most ardent excavator. Be that as it may, current land use practices in the areas of the transects evaluated are not kind to the archaeological resources present.

With very few exceptions (e.g. the Campbell site), we seriously doubt that resource management is a critical consideration for the 1979 project. The Hinsdale sites, were they even legitimate in the first place, appear to be long gone, with the exception of the reconstructed mound on the property of the Stagecoach Inn near Gull Lake. But with respect to potentially significant sites like Campbell, that this parcel now lies fallow should be reason enough for archaeologists to approach the landowner regarding his future plans for the land and his attitude toward excavation of the site.

Several other sites bordering the river in Transect A (the Nagel and Borden sites) should be carefully watched. We are particularly intrigued by the reported presence of a Paleo-Indian component at the latter. And if our informant leads are correct, we must also keep a watchful eye on the Boudeman site. Although the 1979 transects generally lack sites which would be of great value given the current objectives of the Kalamazoo Basin Archaeological Project, a fact indicated by the priority assigned to sites listed in Section 5, they do deserve our consideration and more thorough study.

8. Catalog of Artifactual Material Recovered During Survey

For a complete listing of cultural material recovered during the 1979 Kalamazoo Basin Survey, the reader is referred to Section 5 above. Here, the catalog of artifactual debris has been included together with the brief site description.

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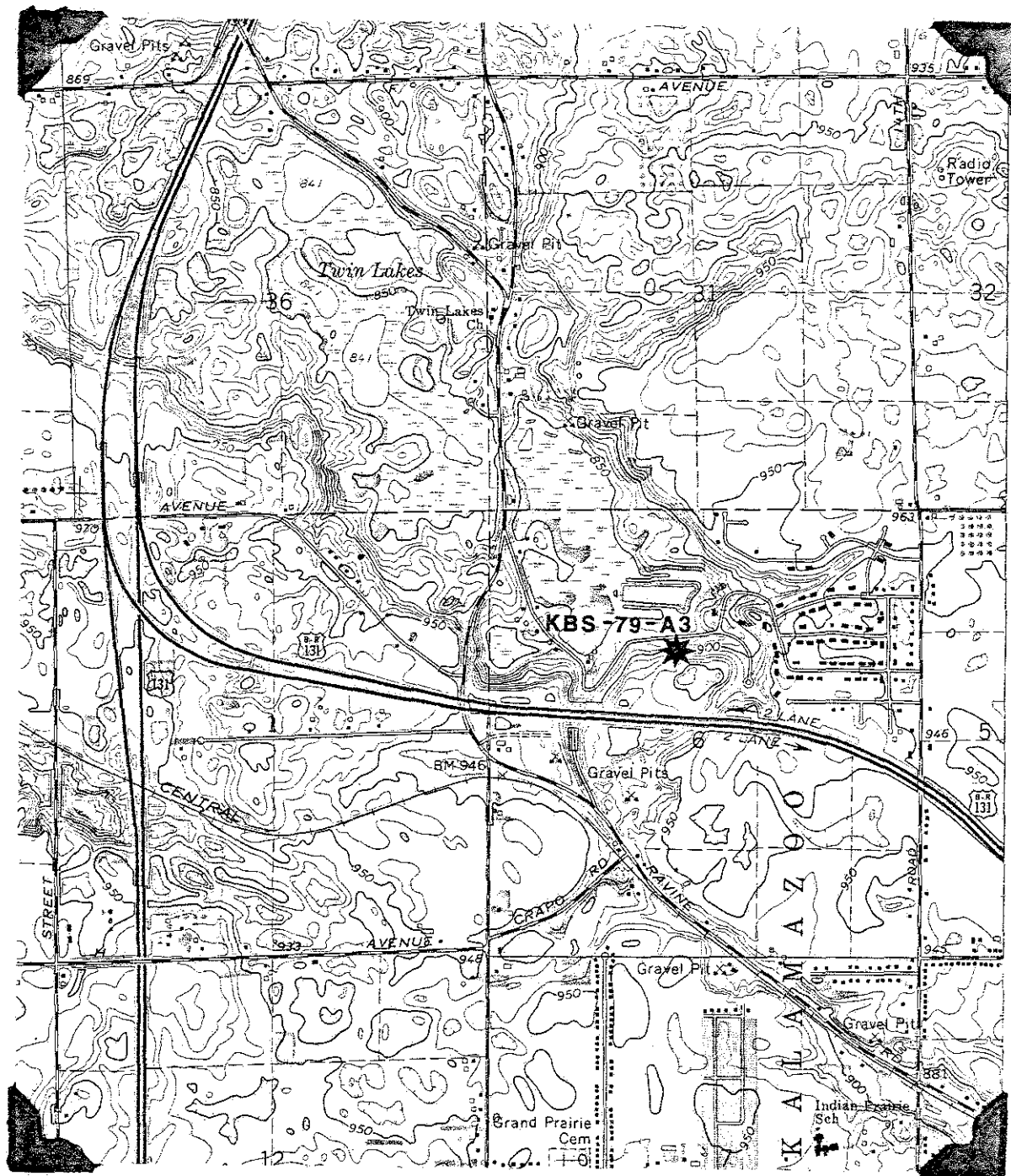
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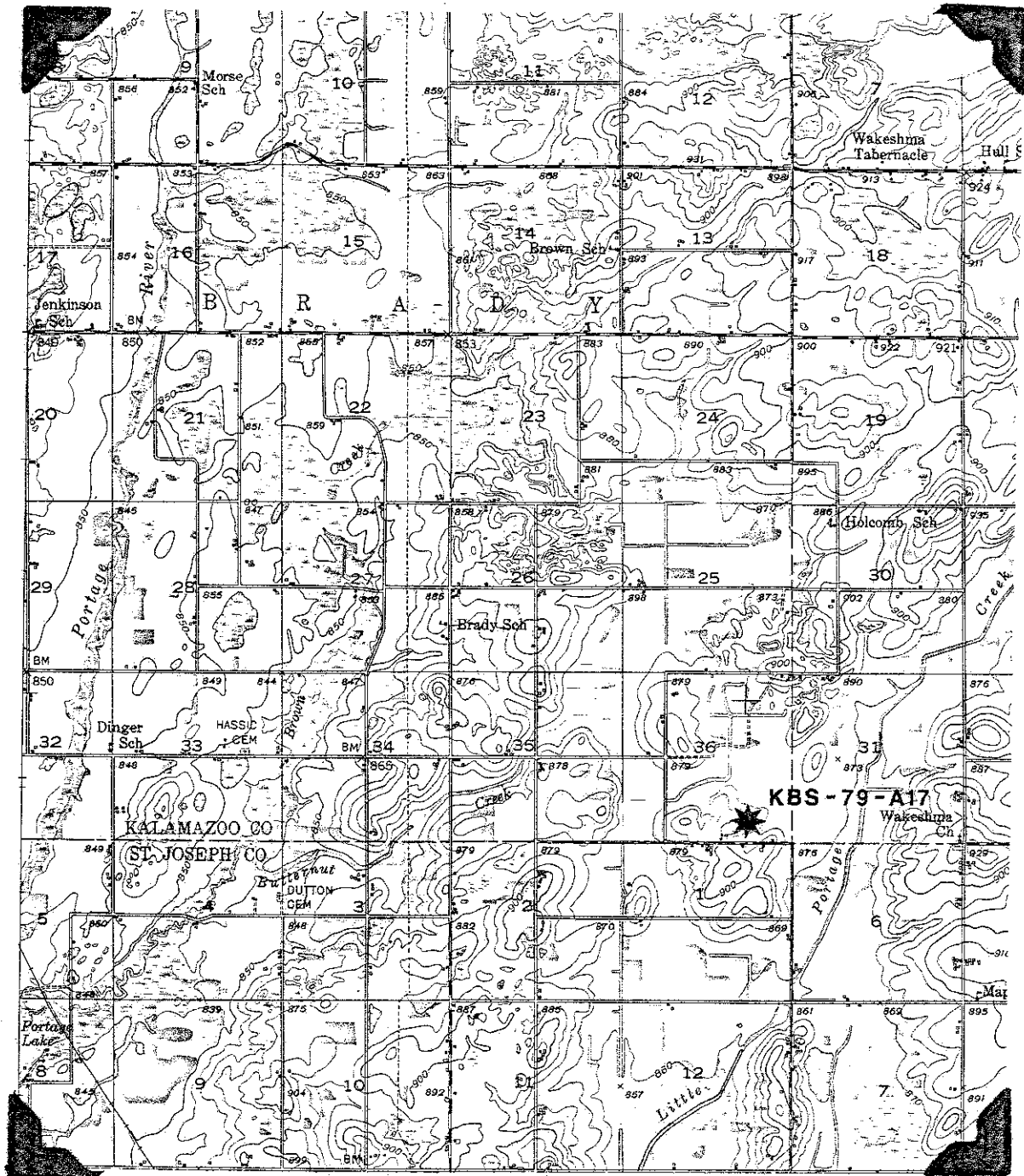
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APPENDIX I

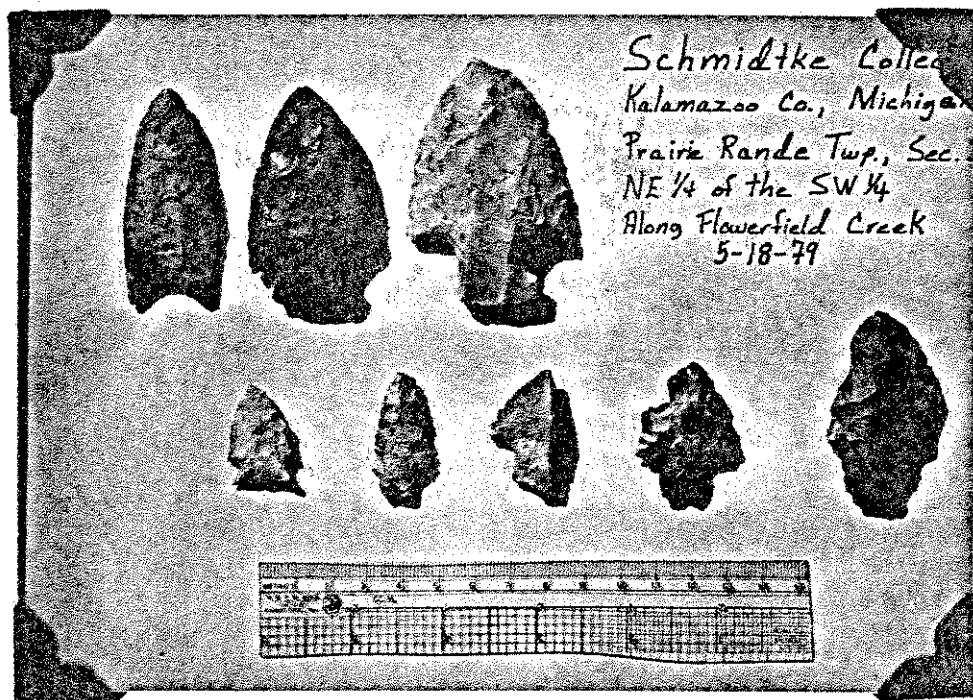
Series of Maps Showing the Locations of
Sites not Indicated on Maps in the Text





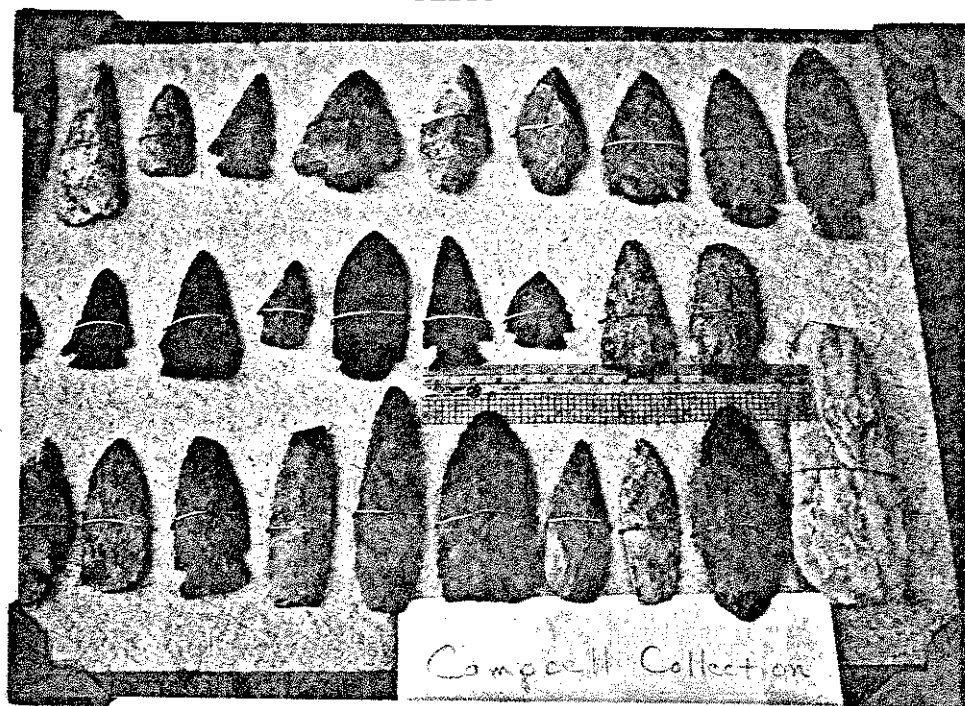
PLATES

Plate 1



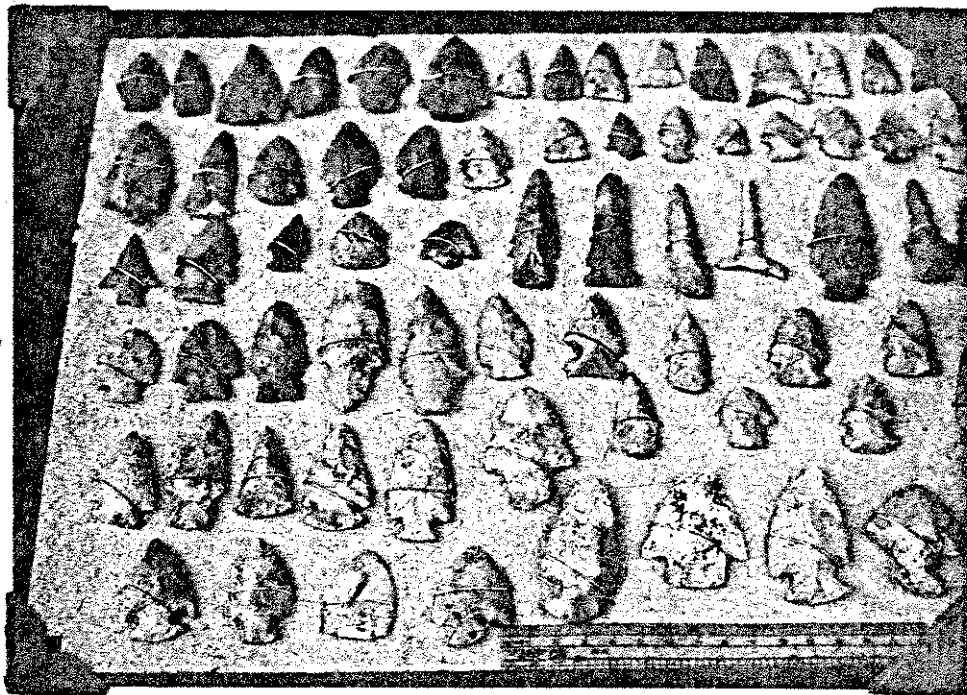
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Plate 2



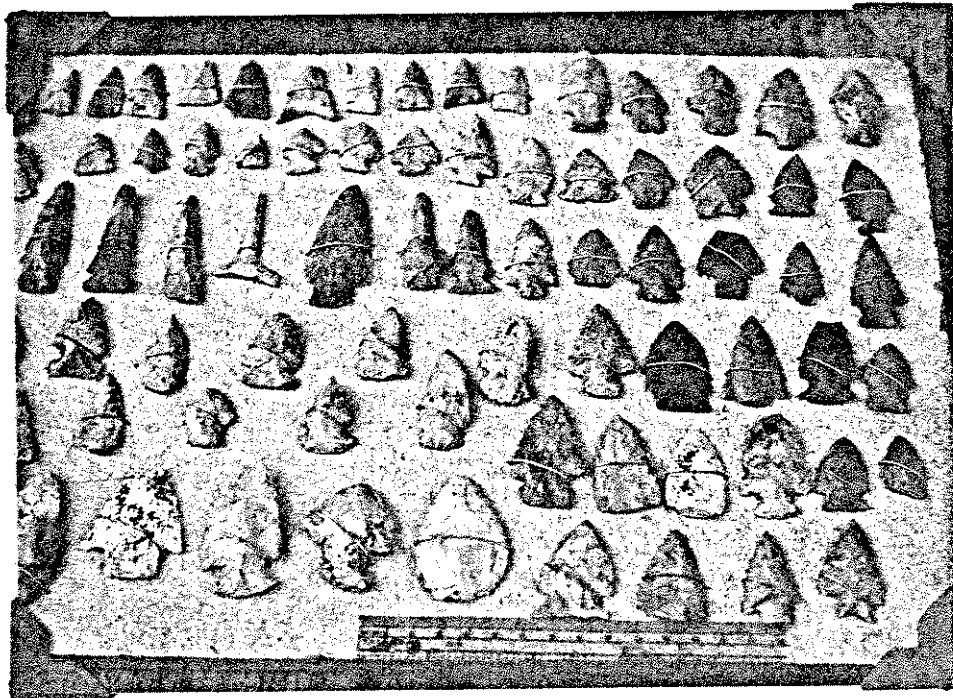
Campbell Collection (KBS-79-B5)

Plate 3



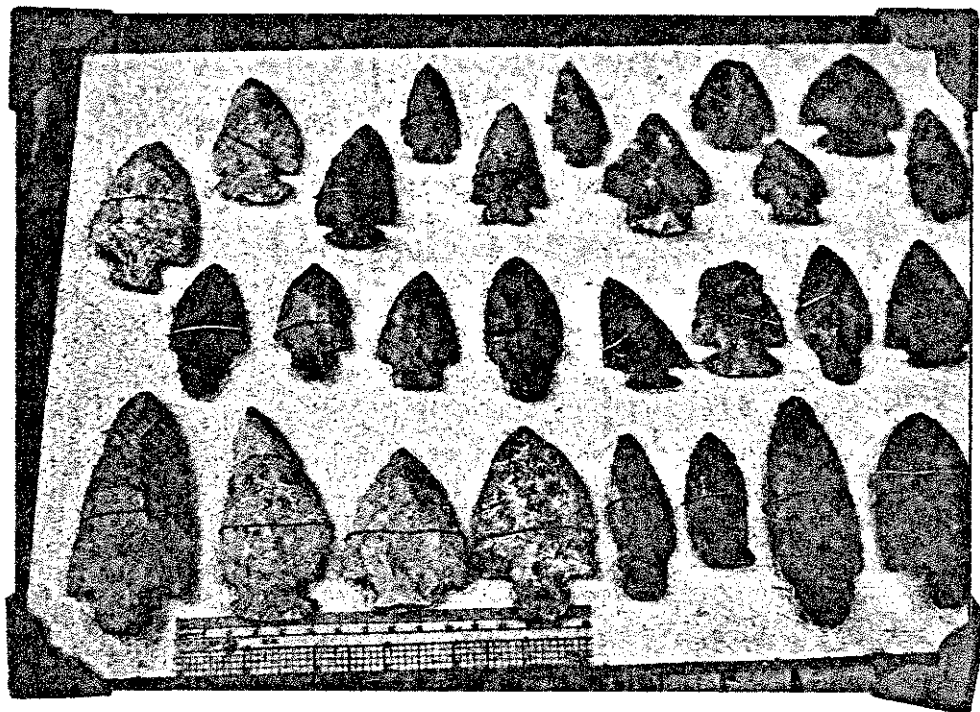
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Plate 4



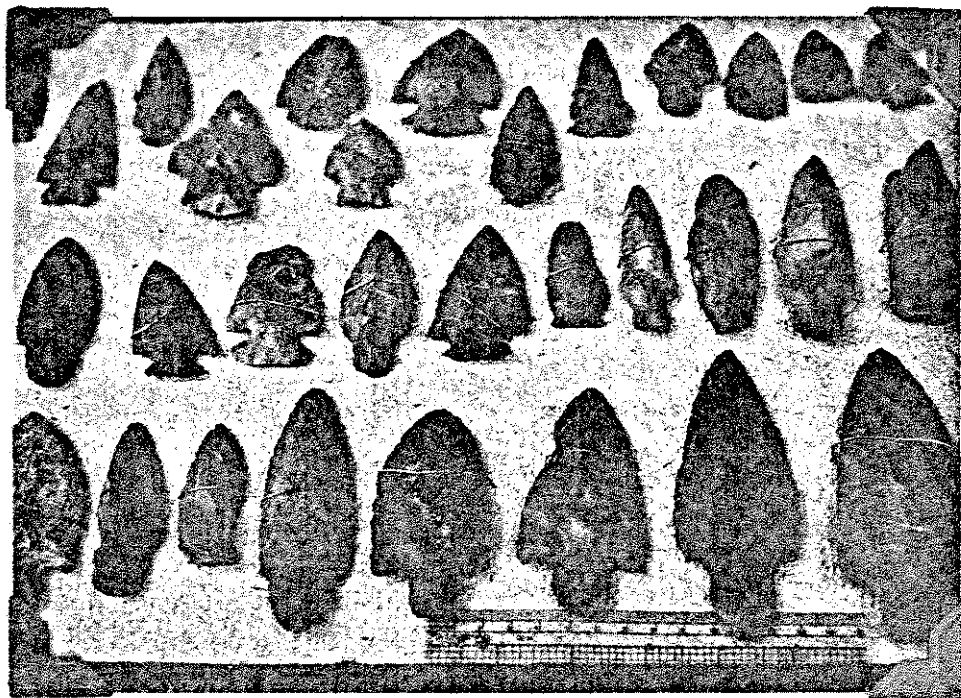
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Plate 5



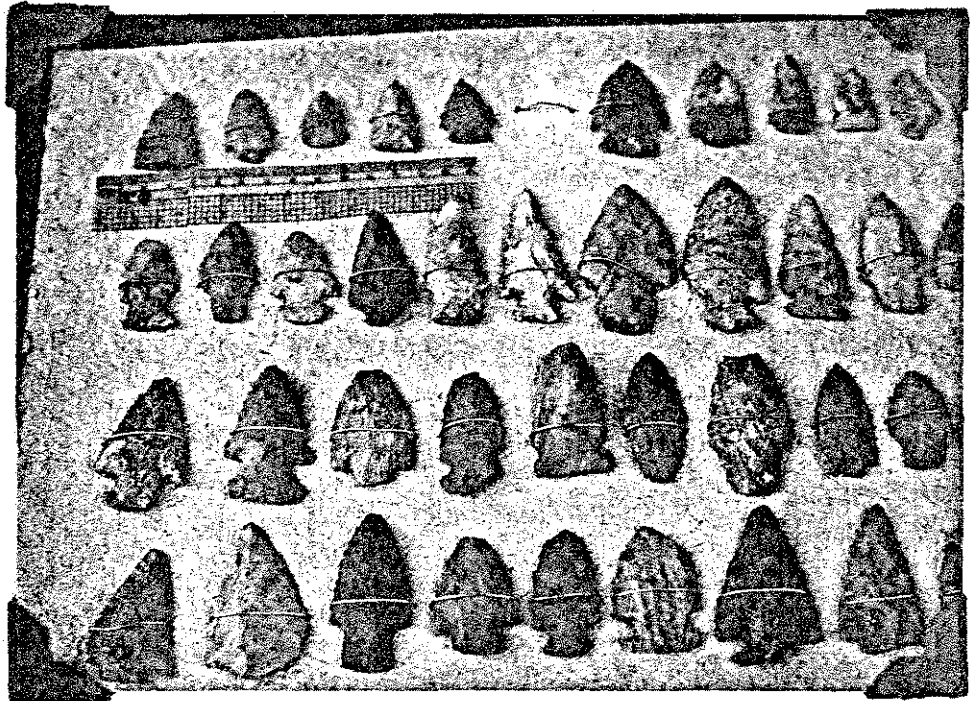
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Plate 6



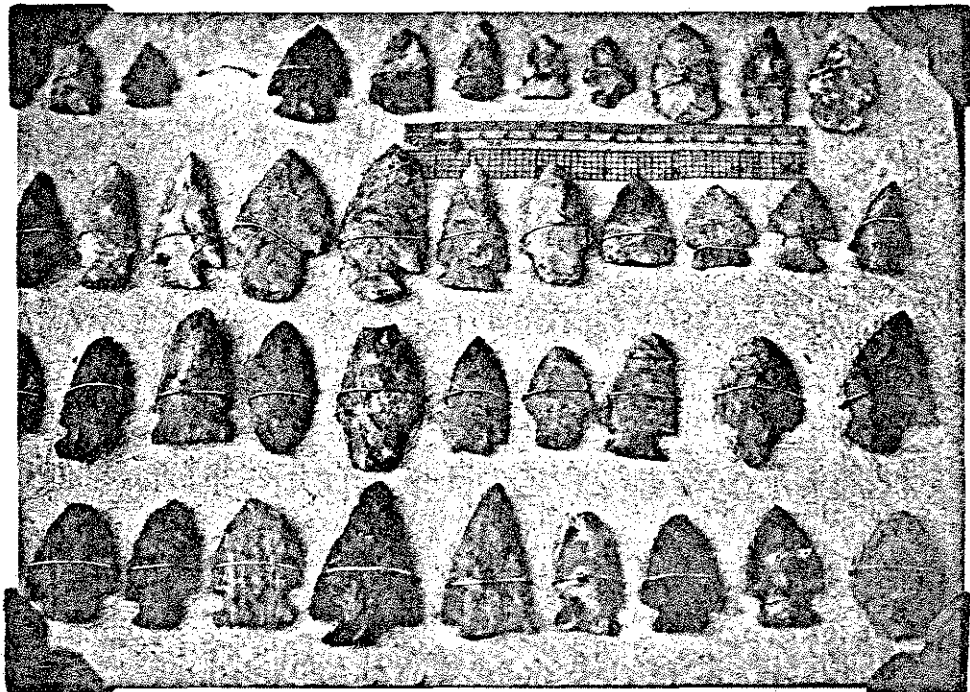
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Plate 7



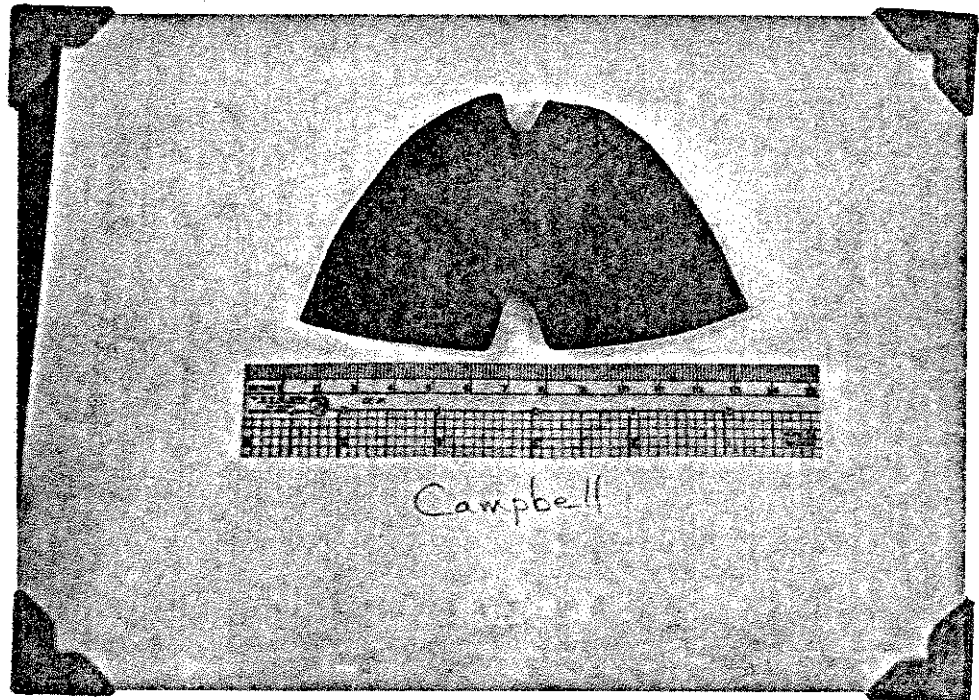
Campbell Collection (KBS-79-B5)

Plate 8



Campbell Collection (KBS-79-B5)

Plate 9



Campbell Collection (KBS-79-B5)