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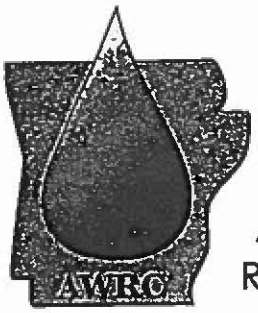

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LANDUSE AND LANDCOVER CLASSIFICATION FOR INDEPENDENCE, UNION, BRADLEY AND CLEVELAND COUNTIES OF ARKANSAS

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INTRODUCTION

Landuse/landcover (LULC) is a function of natural factors such as soils, climate and water and of anthropogenic factors such as predominant use. In Arkansas, the primary use of the land varies depending on the physiographic region. For example, in the Mississippi Delta region of eastern Arkansas row crop agriculture predominates, whereas in the Gulf Coastal Plains forestry dominates. In both regions LULC is spatially and temporally variable. Knowledge of LULC can be used in estimating the potential for agricultural production, locations of critical ecological areas, siting of homes, small businesses, industries, roads and landfills as well as source areas of pollution.

OBJECTIVES

The objectives of this research project were to determine the spatial variability of LULC of four counties in eastern Arkansas during 1992 and to quantify the areal extent of several landuse categories.

METHODS

The LULC presented in this report was originally classified by personnel with the Center for Advanced Spatial Technology (CAST) as a part of the GAP analysis project. The classification was based on 1992 Landsat V Thematic Mapper satellite imagery at 30-meter resolution. Landuse categories consisted of vegetation (tree) types, as well as water and agriculture (primarily pasture). The

GAP vegetation classification was produced for Arkansas; the coverages of Independence, Union, Bradley, and Cleveland counties were extracted from the state coverage (Figure 1). In producing county LULC maps from these data, consistent color schemes were chosen to display as much contrast between categories as possible. Details about the methods of image classification used by the CAST staff can be found under the CAST home page at http://www.cast.uark.edu/~rob/.

The geographical information system known as Geographical Resources Analysis Support System or GRASS was used as the spatial data manager. GRASS is well known for its ability to display raster databases and was developed by the Corps of Engineers at Champaign, IL. The computer work was accomplished on a SUN Microsystems SPARC 5.

In addition to LULC, incorporated areas within each county are displayed on the maps. The sources of these data were 1990 U. S. Census Bureau TIGER vector files at a scale of 1:100,000. These vector data were converted to a raster format and were then superimposed on the county LULC maps.

Major roads were also provided on the county maps for reference. The sources of these road data was the United States Geological Survey (USGS) 1:100,000 scale digital line graphs. Major roads contained in these vector files were selected for display using the GRASS module v.digit. Major roads were determined by overlaying a 1:500,000 scale vector map of major Arkansas highways for reference. The 1:500,000 scale road map was

digitized by the Arkansas Archeological Survey.

Areal summaries of the LULC are presented in Table 1 for the various landuse categories in each county. These results indicate that the dominant landuse in each county is forests. The areas classified in agriculture for the three southeast counties in Arkansas were similar and was about 10% of the county area. In Independence County agriculture represented slightly over 42% of the county area. Spatial distributions of the LULC in the four counties are presented in Figures 2 - 5.

Table 1. Areal summary of the land use/land cover category by county.

County	Land use category	acres	% cover
Independence	shortleaf pine	19,684	3.99
	oak-shortleaf pine-hickory	98,143	19.89
	eastern red cedar	23,012	4.66
	white oak-mixed hardwoods	59,761	12.11
	northern red oak-mixed oaks	3,501	0.71
	southern red oak-mixed oaks	14,830	3.01
	post oak	23,328	4.73
	shortleaf pine-mixed oaks	6,589	1.34
	oak-hickory (black)	1,098	0.22
	water hickory-white ash-overcup	34	0.01
	sugarberry-mixed ash-mixed hickory	46	0.01
	nutall oak-mixed oaks-mixed hickory	1,556	0.32
	willow oak-mixed oaks-mixed hickory	6,483	1.31
	baldcypress-mixed hardwoods	519	0.11
	water tupelo-ball cypress-tupelo	80	0.02
	mixed willows-mixed cottonwoods	14	0.00
	water	6,599	1.34
	agriculture (pasture)	210,465	42.65
	incorporated areas	12,997	2.63
	sparsely vegetated area	3,218	0.65
	Total	493,495	
Union	loblloly pine	223,992	33.19
	loblloly pine-shortleaf pine-oak	120,984	17.93
	white oak-mixed hardwoods	104,717	15.52
	sugarberry-mixed ash-mixed hickory	11,459	1.70
	nutall oak-mixed oaks-mixed hickory	48,169	7.14
	willow oak-mixed oaks-mixed hickory	30,341	4.50
	baldcypress-mixed hardwoods	21,418	3.17
	water tupelo-ball cypress-tupelo	18,298	2.71
	water	13,940	2.07
	agriculture (pasture)	62,160	9.21
	incorporated areas	19,317	2.86
	sparsely vegetated area	3	.00
	Total	674,797	

Table 1 continued.

Cleveland	shortleaf pine	196	0.05
	loblloly pine	142,924	37.32
	loblloly pine-shortleaf pine-oak	33,258	8.68
	white oak-mixed hardwoods	39,779	10.39
	sugarberry-mixed ash-mixed hickory	2,881	0.75
	nutall oak-mixed oaks-mixed ash	47,696	12.45
	willow oak-mixed oaks-mixed hickory	57,347	14.97
	baldcypress-mixed hardwoods	9,927	2.59
	water tupelo-ball cypress-tupelo	3,769	0.98
	water	2,517	0.66
	agriculture (pasture)	40,296	10.52
	incorporated areas	2,426	0.63
	sparsely vegetated area	2	0.00
	Total	383,014	
Bradley	loblloly pine	136,177	32.53
	loblloly pine-shortleaf pine-oak	55,941	13.36
	white oak-mixed hardwoods	41,038	9.80
	sugarberry-mixed ash-mixed hickory	5,107	1.22
	nutall oak-mixed oaks-mixed ash	44,558	10.64
	willow oak-mixed oaks-mixed hickory	33,119	7.91
	baldcypress-mixed hardwoods	34,819	8.32
	water tupelo-ball cypress-tupelo	15,867	3.79
	water	3,785	0.90
	agriculture (pasture)	43,064	10.29
	incorporated areas	5,157	1.23
	sparsely vegetated area	2	0.00
	Total	418,635	

Figure 1. Arkansas Location of Four Counties

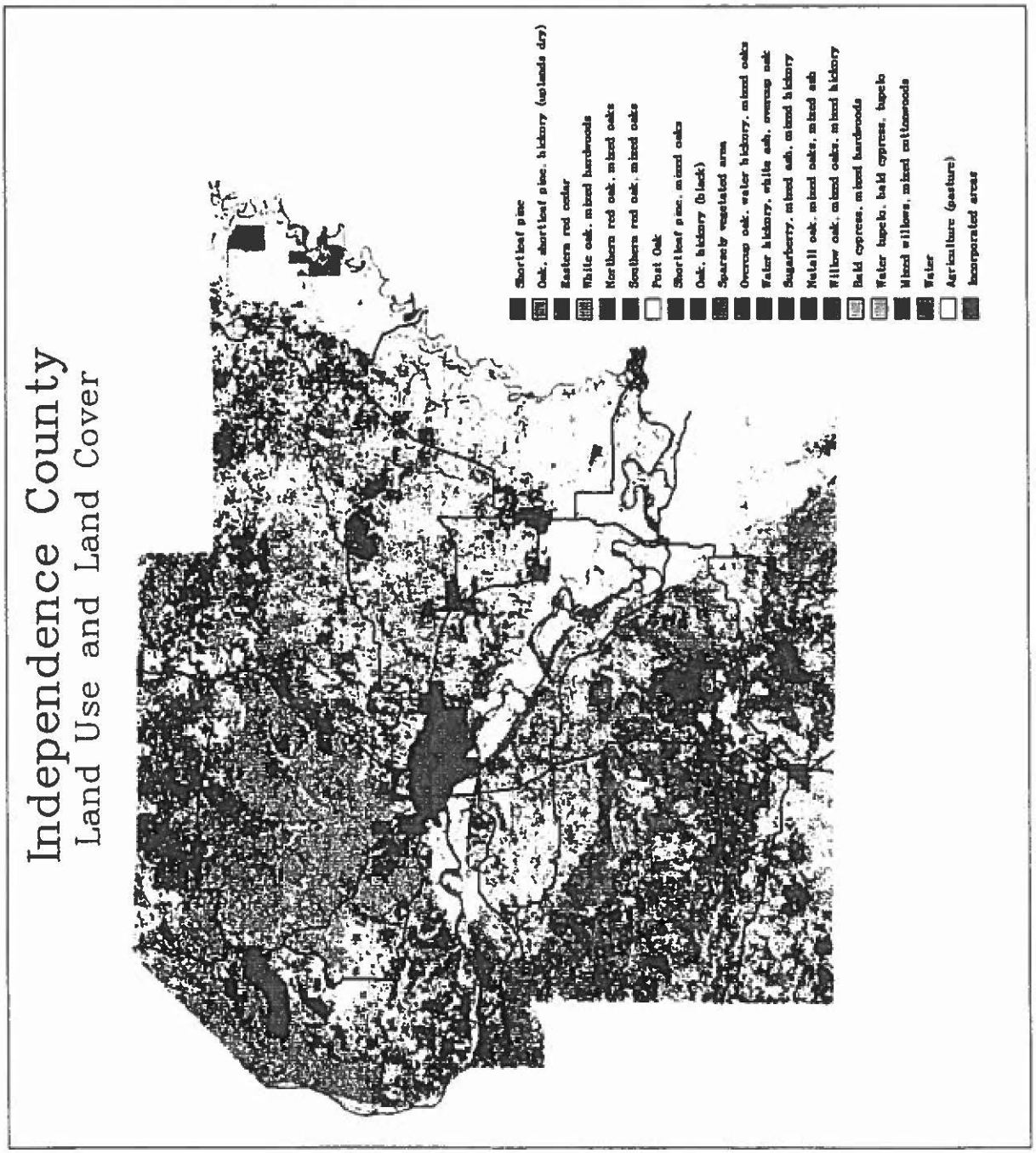

Figure 2. Independence County Land Use and Land Cover

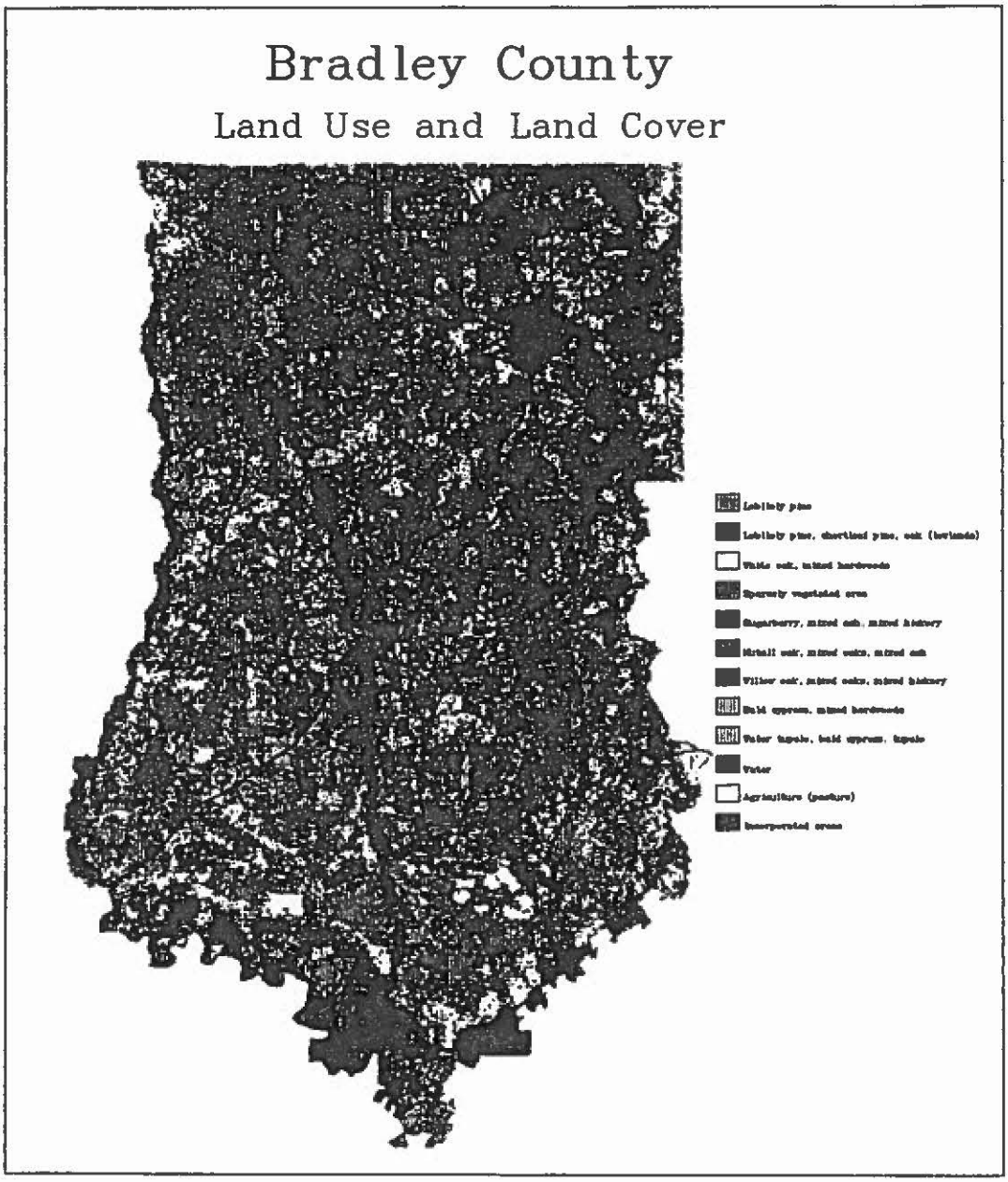

Figure 3. Bradley County Land Use and Land Cover

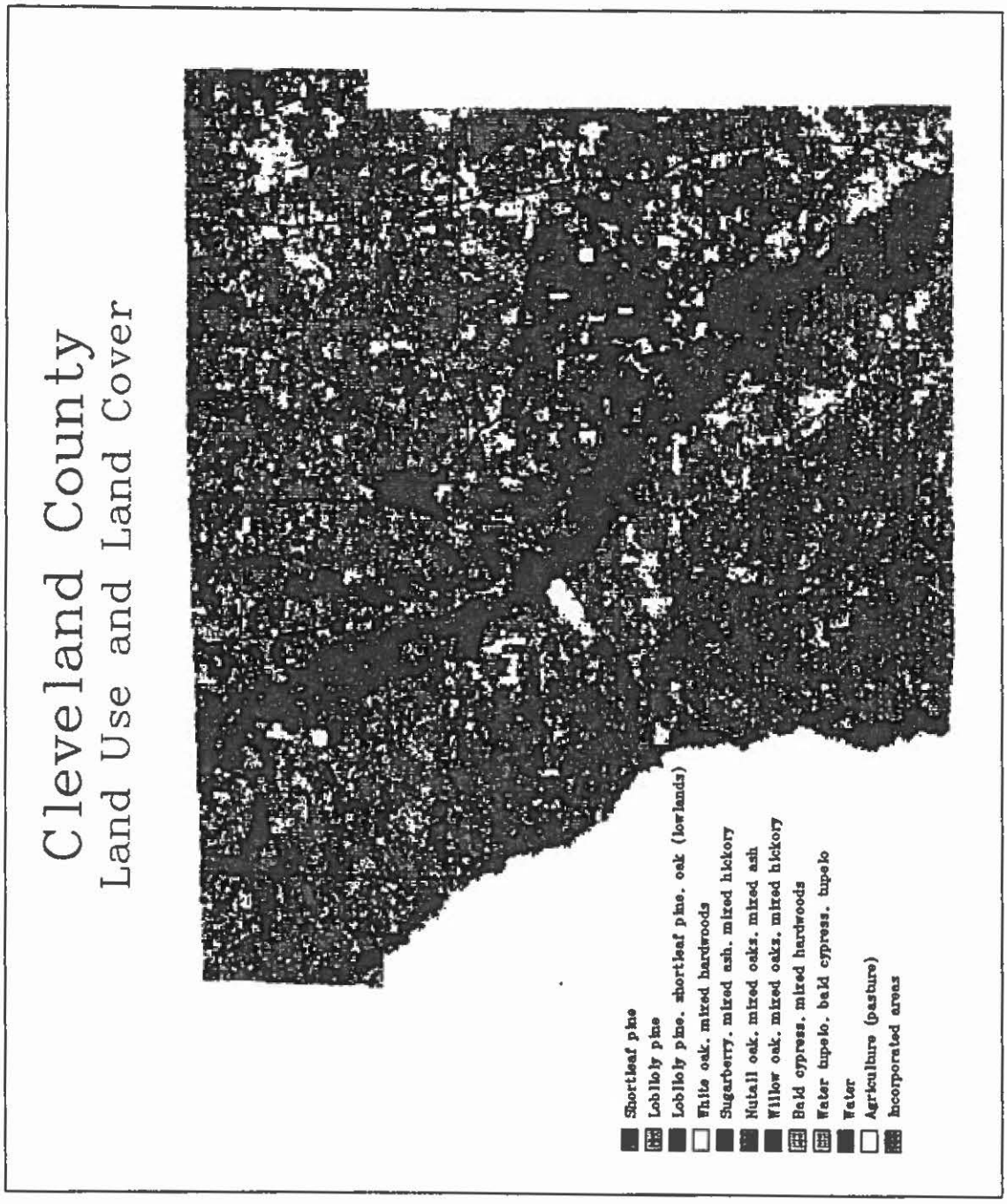

Figure 4. Cleveland County Land Use and Land Cover

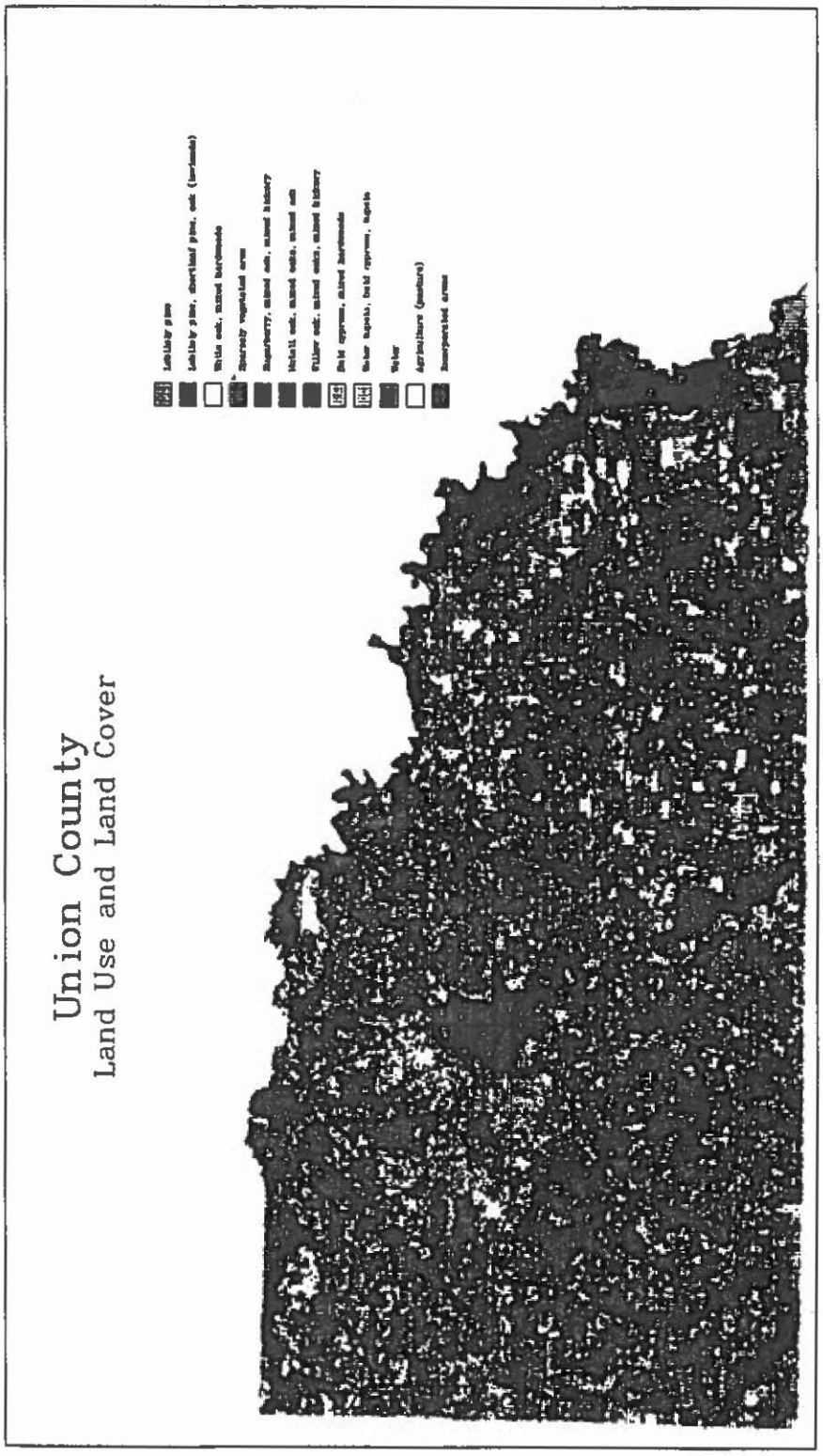

Figure 5. Union County Land Use and Land Cover