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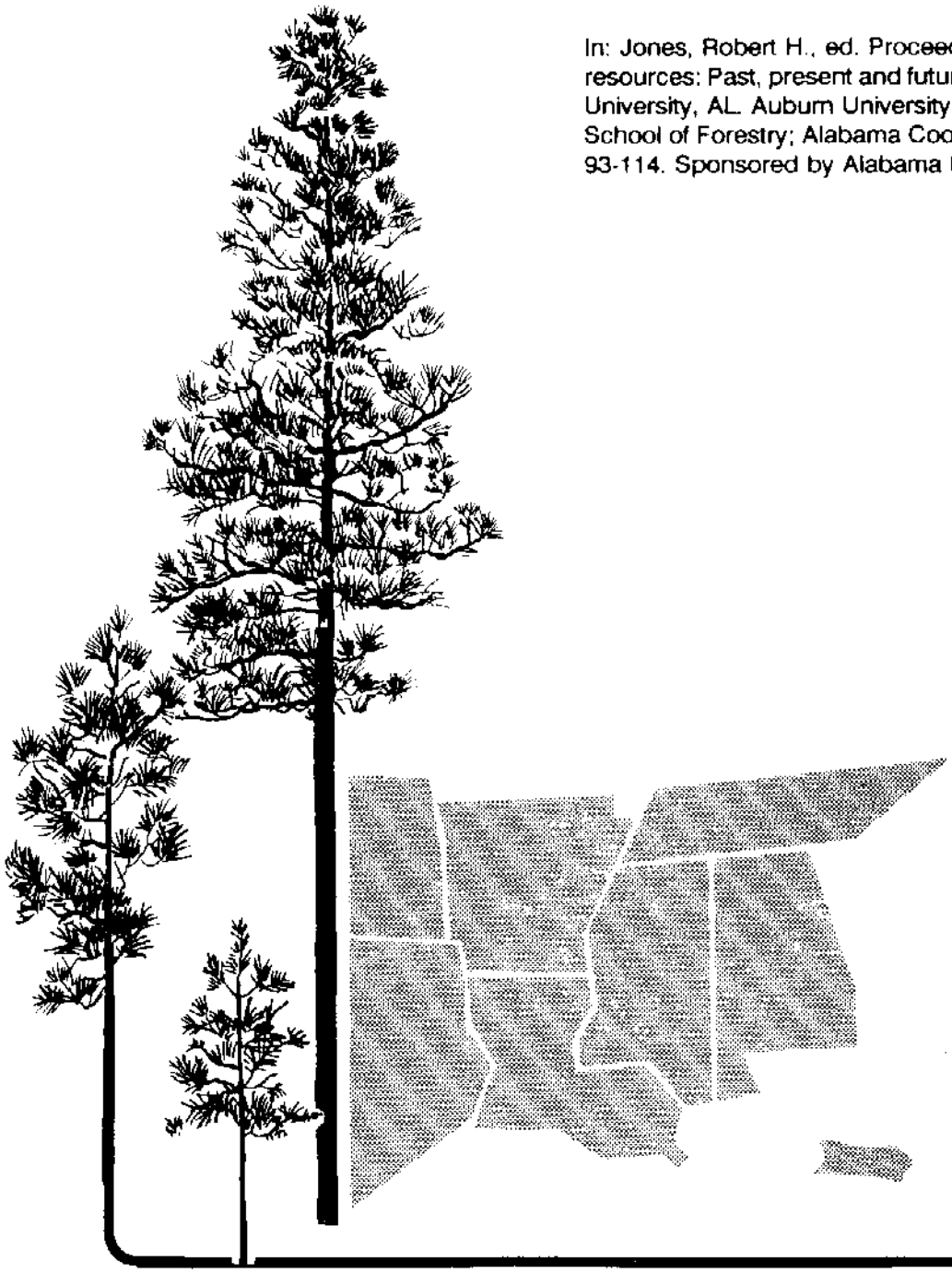

Southern Forest Experiment Station

A RECREATION AND LANDSCAPE PERSPECTIVE OF ALABAMA'S CHANGING FOREST ENVIRONMENT: THE HUMAN CHARACTER OF FORESTS

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There is rising concern that the growing demand for outdoor recreation and accumulating human effects on forested ecosystems are competing with the forest's ability to sustain multiple values. In Alabama, hunting alone was estimated to generate over one-half billion dollars annually in added revenues for the 1986-87 hunting season (Wallace and others 1991). Hunting leases, estimated at 31 million dollars in the 1986-87 hunting season, form a substantial source of income to rural landowners in the southern counties of the State (Wallace and others 1991). A comprehensive inventory of forested areas logically must provide information not only on timber volume but on associated market and nonmarket values to provide a better understanding of forest resources available for a variety of needs.

The U.S. Department of Agriculture, Forest Service, Forest Inventory and Analysis (FIA) forest survey provides a basis for assessing recreational opportunities and related landscape-level ecosystem concerns in forested areas--the subject of this presentation. Recreational opportunities, valued in market and nonmarket terms, generally are greatest for forests near populated areas and forests near large bodies of water. Aesthetic, largely nonmarket values are ascribed generally to older forests and to forests with relatively sparse understory vegetation, with attractive and unique features, and without human intrusions. Many wildlife-related recreational opportunities, valued in terms of the abundance and diversity of wildlife species, are sensitive to the status and trends in forest area, particularly by forest type, stand size, and regional distribution.

Figures 1 through 17 and Tables 1 through 5 represent an overview of the 1990 Alabama FIA survey that describes managerial, human, and biophysical attributes associated with forest recreational opportunities. Many of the attributes also can be used to model timber availability. Suggestions on avenues for further evaluation or classification are welcomed. Other published reports on these topics reference Alabama's 1982 survey (Rudis 1986, Rudis and others 1984).

Forested land dominates in central and southern Alabama. Nonforested areas dominate in the north along the Tennessee River and the Birmingham

metropolitan area, in the central portion along the Blackland Prairie and Montgomery metropolitan area, and in the southeast portion near Dothan (Figures 1a, 1b). Data from the U.S. Census of Agriculture (personal communication) and an urban-to-rural county classification system (Butler 1990) provide an important perspective on nontimber market values of Alabama's timberland that reflects its location. Trends between 1978 and 1987 suggest that the dollar value of land in more urbanized counties is increasing steadily and more rapidly than in less urbanized or rural counties (Figure 2a).

In addition to traditional FIA estimates of timberland by stand size, stand age, and overstory species composition, recreation-related attributes include proximity to urban areas and developed roads (Figure 3), proximity and size of open-water bodies (Figure 4), soil erosion potential as reflected by slope (Figure 5), remoteness (Figure 6), and proximity to agricultural land (Figure 7). Attractive and unique features include proximity to large bodies of water (Figure 4), topographic variability as represented by slope (Figure 5), and presence of Spanish moss (Figure 8).

Human intrusions are defined relative to particular recreational opportunities and users and by evidence of forest stand manipulation and artifacts associated with human use (Figure 9). Human intrusions noted in the FIA survey include beverage containers (Figure 10a), discarded materials (Figure 10b), evidence of livestock use (Figure 11), and timber production activities, including presence of pine plantations and logging debris.

At the landscape level, remote timberland areas are fragmented, with major distributions clustered near and in the National Forests, in Jackson County, and in southwest Alabama (Figure 6). Trends since the previous survey suggest that forests suited to roadless or primitive recreational opportunities are decreasing, and forests suited to roaded or urban recreational opportunities are increasing (Figures 12a, 13). Formerly large forest tracts are becoming fragmented, particularly in urbanized counties and along the Tennessee-Tombigbee Waterway (Figure 14b). Increases in paved roads, trails, and right-of-ways continue to make many forests more accessible, while dirt and gravel roads in other forests are decreasing (Figure 15).

Forests are shifting largely to loblolly pine plantations in south and west Alabama (Figure 16), and to oak-hickory stands in north and east Alabama (Figure 17). There are large increases in loblolly pine sapling-seedling stands, moderate increases in oak-hickory stands in sawtimber and sapling-seedling stand-size classes, and decreases in other pine types (Tables 1, 2, and 3). The rise in loblolly and decline in other pine forest types have been continuing since the 1972 survey (Table 4). In 1990, the oak-hickory forest type increased dramatically compared with the 1972 survey (Table 5).

The relative amount and type of recreational opportunity can be inferred from attributes of FIA data combined with knowledge of forest recreation users (Rudis 1987). It is more difficult to place a numerical value on an array of recreational opportunities and to associate forest conditions with wildlife populations valued by recreationists. A cogent assessment of the recreational

opportunities derived from forested areas ultimately requires involvement from other research disciplines and agencies concerned with natural resource planning (see Rudis 1990). Preparation of a suitability index for recreational opportunities from FIA data attributes, examination of land use trends at the landscape scale, and incorporation of available geographically-referenced data on recreation facilities from other agencies are goals for future assessments.

References

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Table 1.--**Area of longleaf-slash timberland by stand-size class and detailed forest type, Alabama, 1990, and change since 1982**[a]

Stand-size class	Longleaf		Slash	
	1990	Change	1990	Change
	Thousand acres			
Sawtimber	319.9	-74	215.1	+3
Poletimber	114.9	-24	241.7	+23
Sapling-seedling	100.2	-62	195.1	-89
Nonstocked	5.4	-1	5.1	-1
All classes	540.5	-160	657.0	-64

[a]Columns may not sum to totals due to rounding.

Table 2.--**Area of loblolly-shortleaf timberland by stand-size class and detailed forest type, Alabama, 1990, and change since 1982**[a]

Stand-size class	Loblolly		Shortleaf		Virginia		Other[b]	
	1990	Change	1990	Change	1990	Change	1990	Change
	Thousand acres							
Sawtimber	1,638.0	-106	264.3	-153	115.8	-67	28.3	-7
Poletimber	1,452.9	+303	132.1	-197	157.7	-32	39.7	+23
Sapling-seedling	2,188.3	+710	70.6	-89	114.7	+28	52.6	+23
Nonstocked	4.9	-1	0.0	0	0.0	+0	0.0	0
All classes	5,284.1	+905	467.0	-439	388.2	-71	120.6	+39

[a]Columns may not sum to totals due to rounding.

[b]Eastern redcedar, spruce pine, and sand pine.

Table 3.--**Area of hardwood timberland by stand-size class and forest type, Alabama, 1990, and change since 1982**[a,b]

Stand-size class	Oak-pine		Oak-hickory		Oak-gum-cypress		Elm-ash-cottonwood	
	1990	Change	1990	Change	1990	Change	1990	Change
	Thousand acres							
Sawtimber	1,552.1	+124	2,198.4	+276	1,296.1	+65	6.3	-5
Poletimber	1,085.3	-201	2,125.9	-167	562.2	-193	0.0	0
Sapling-seedling	1,884.4	+173	3,325.2	+126	394.9	-75	10.0	-19
Nonstocked	0.0	0	11.9	-17	5.7	0	0.0	0
All classes	4,521.8	+96	7,661.4	+219	2,258.9	-203	16.3	-24

[a]Columns may not sum to totals due to rounding.

[b]Nontyped timberland, 11,100 acres, down 31,000 acres since 1982.

Table 4.--**Change in area of pine timberland by stand-size class and detailed forest type, Alabama, 1972-90**[a]

Stand-size class	All pine types	Longleaf-slash		Loblolly-shortleaf			
		Longleaf	Slash	Loblolly	Shortleaf	Virginia	Other[b]
	Thousand acres						
Sawtimber	-344	-118	+7	+70	-330	+24	-1
Poletimber	-567	-67	+45	-25	-487	-62	+28
Sapling-seedling	+346	-51	-142	+964	-440	-24	+40
Nonstocked	+4	+5	+5	-1	-6	0	0
All classes	-561	-230	-84	+1,007	-1,263	-62	+67

[a]Columns may not sum to totals due to rounding.

[b]Eastern redcedar, spruce pine, and sand pine.

Table 5.--**Change in area of hardwood timberland by stand-size class and detailed forest type, Alabama, 1972-90**[a]

Stand-size class	All hardwood types[b]	Oak-pine	Oak-hickory	Oak-gum-cypress	Elm-ash-cottonwood
	----------Thousand acres----------				
Sawtimber	+1,108	+58	+906	+143	0
Poletimber	-740	-525	+148	-358	-6
Sapling-seedling	+841	-92	+946	-11	-1
Nonstocked	-53	0	-47	-6	0
All classes	+1,155	-559	+1,953	-232	-7

[a]Columns may not sum to totals due to rounding.

[b]Nontyped timberland, down 20,000 acres since 1972.

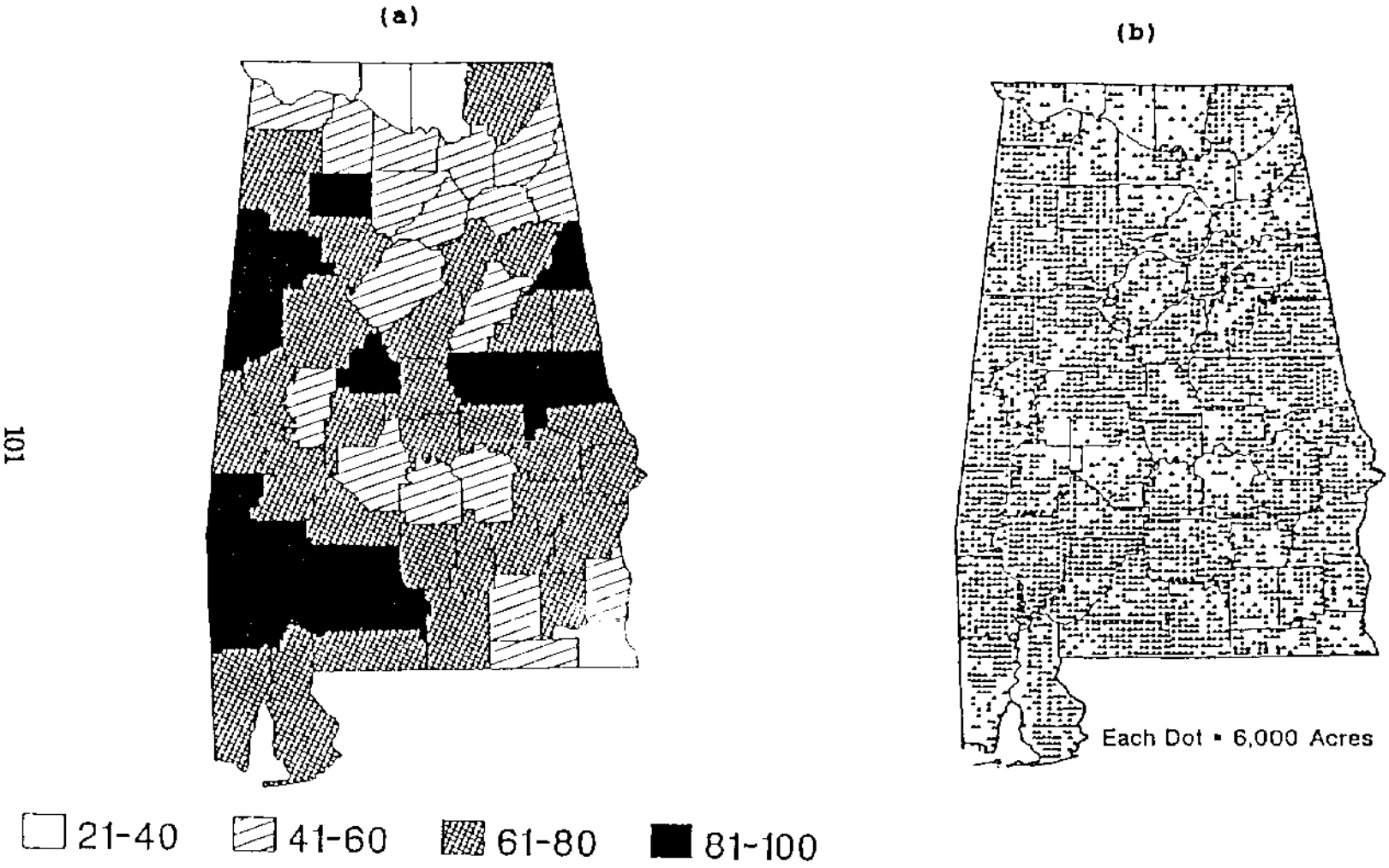

Figure 1.--**(a) Timberland area by county, Alabama, 1990.**

(b) Timberland sample plots, Alabama, 1990.

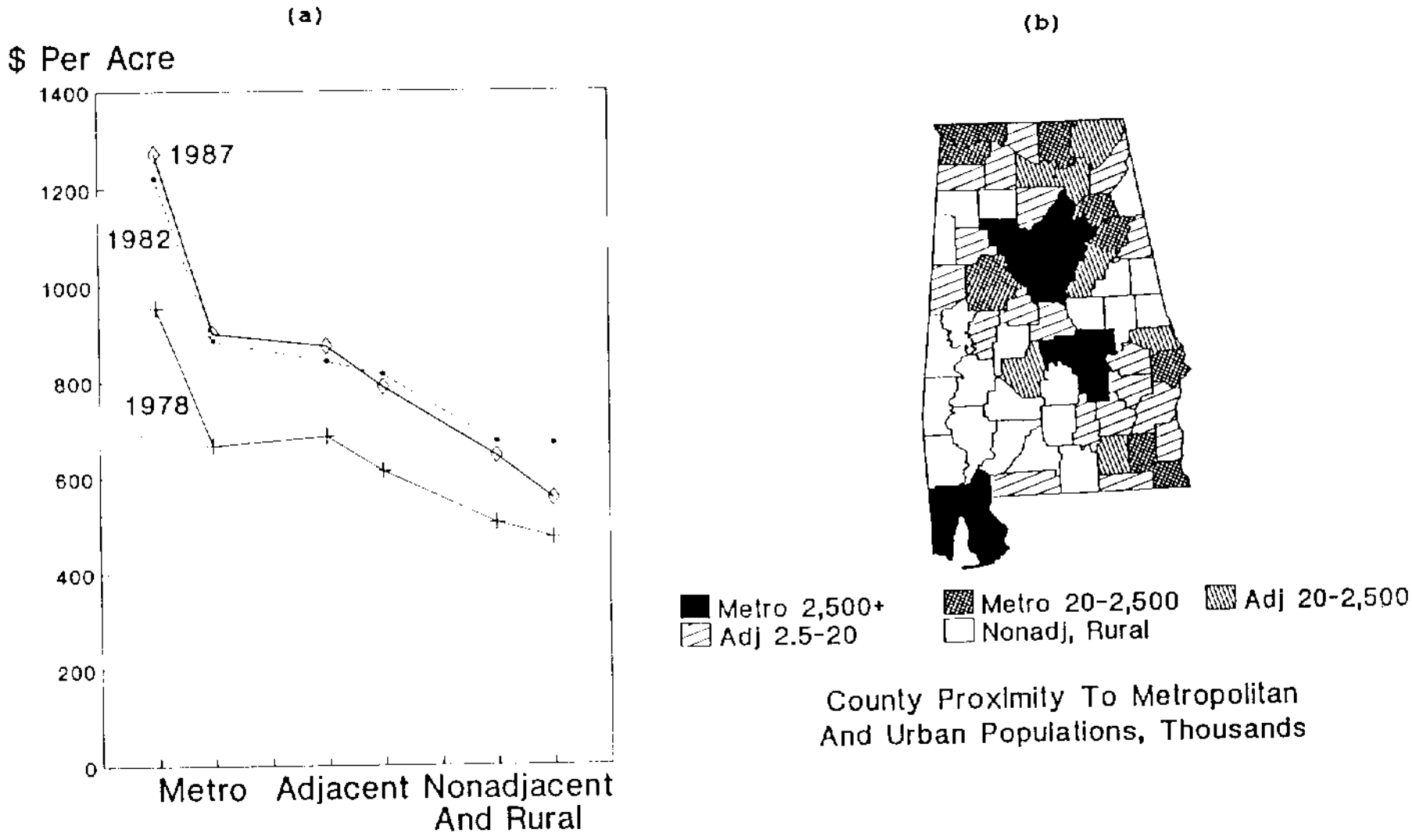

Figure 2.--(a) Average farmland values by urban-rural continuum, Alabama. (County estimates from: U.S. Census of Agriculture, personal communication). (b) County distribution by urban-rural continuum. (Modified from

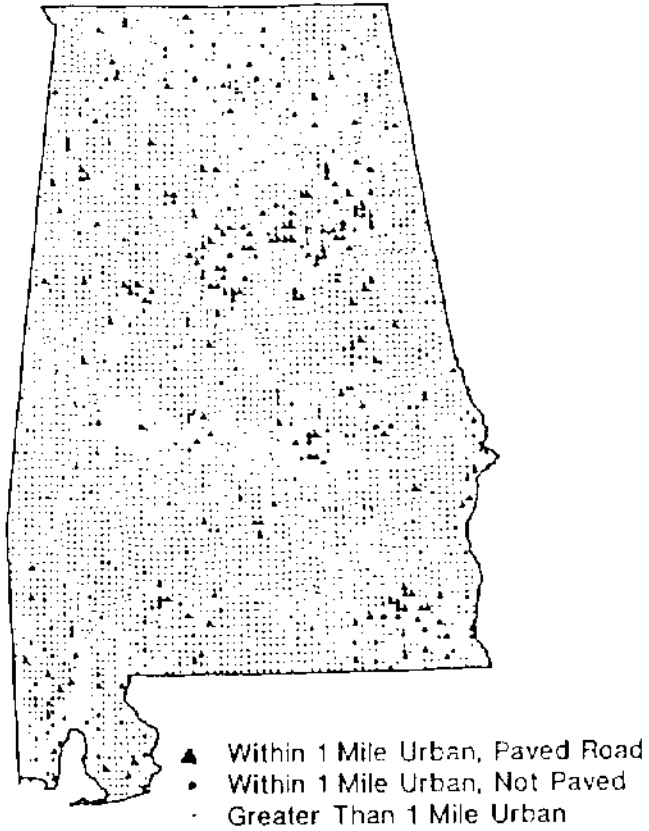

Figure 3.--Timberland sample plots by urban proximity and road condition within a quarter mile, Alabama, 1990.

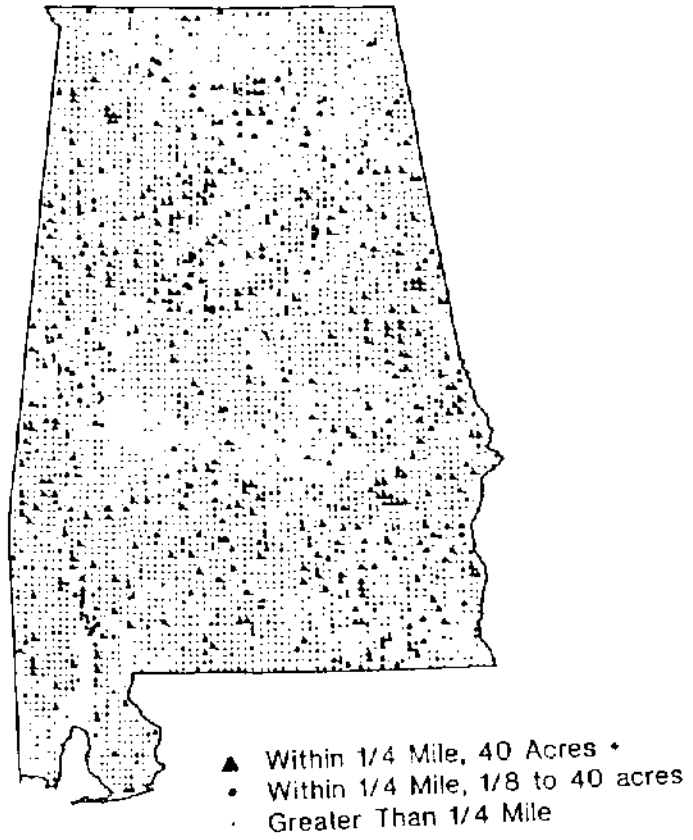

Figure 4.--Timberland sample plots by open-water proximity and size of water body, Alabama, 1990.

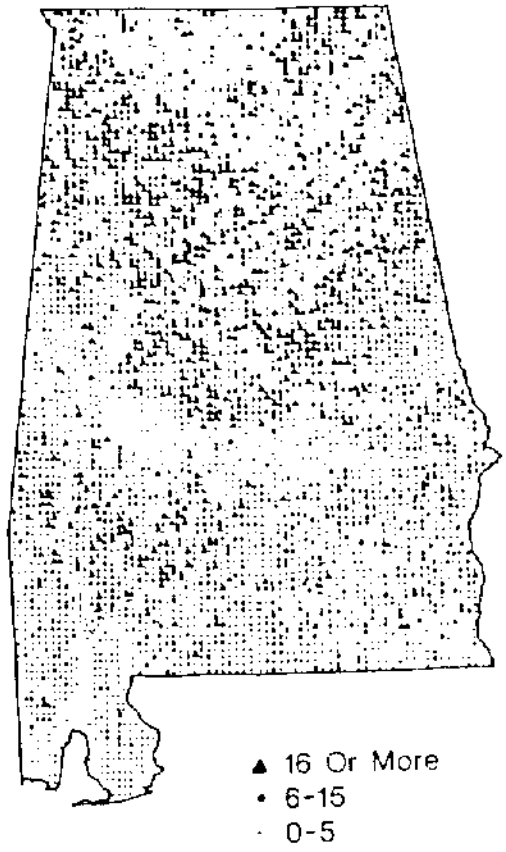

Figure 5.--**Timberland sample plots by percentage of slope, Alabama, 1990.**

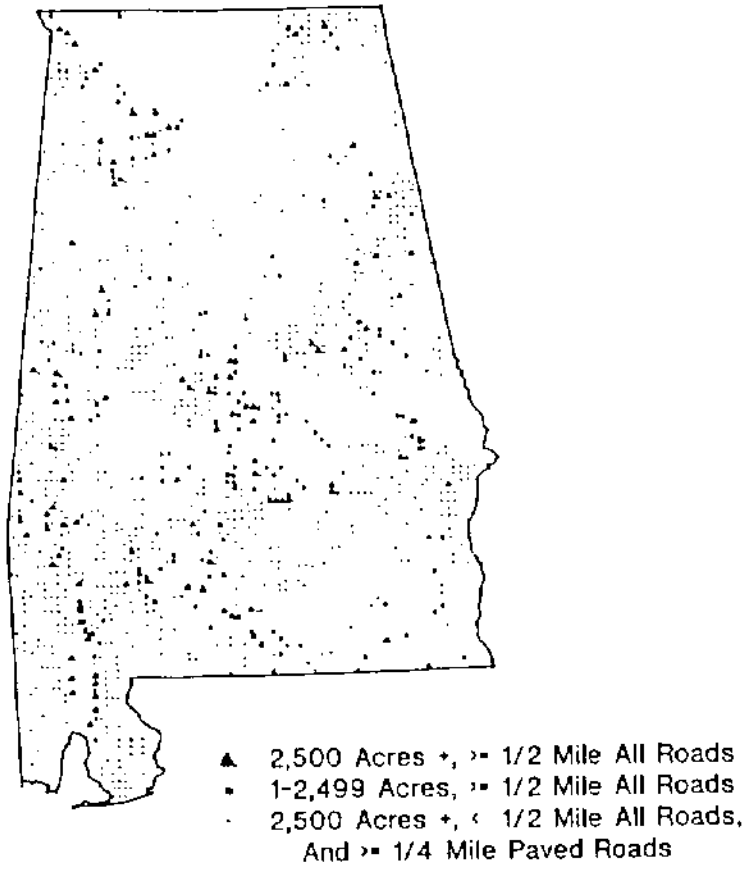

Figure 6.--**Remote timberland sample plots by tract size and distance and condition of roads, Alabama, 1990.**

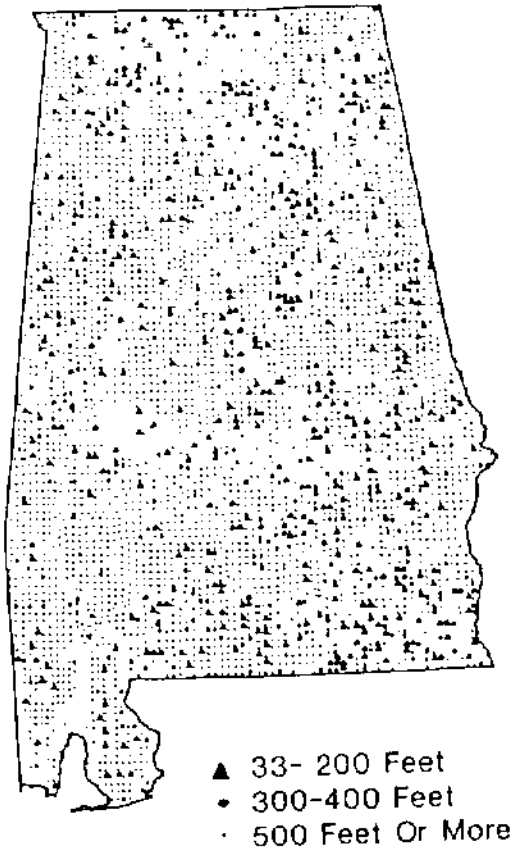

Figure 7.--**Timberland sample plots by proximity to agricultural land, Alabama, 1990.**

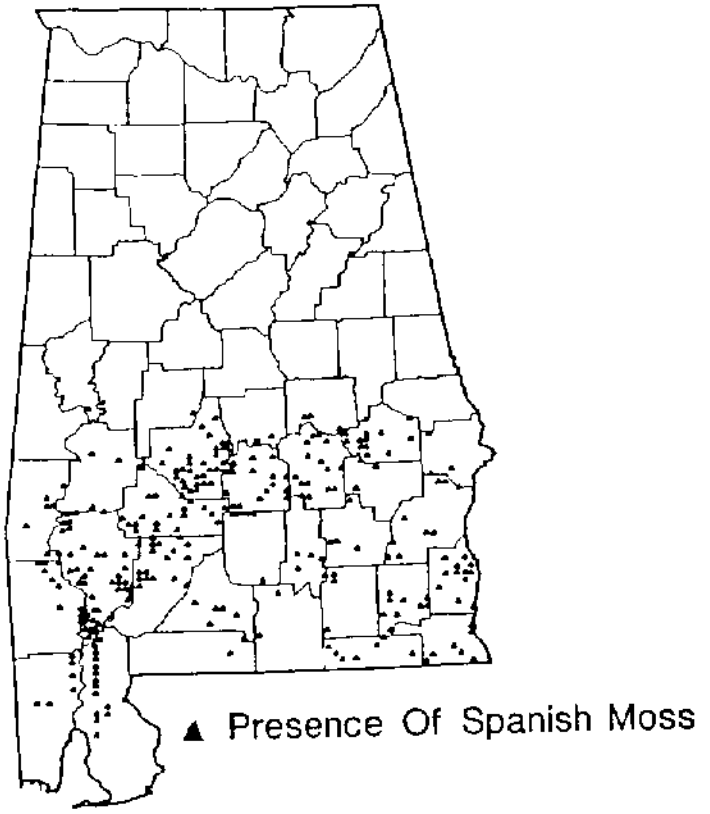

Figure 8.--**Timberland sample plots with Spanish moss, Alabama, 1990.**

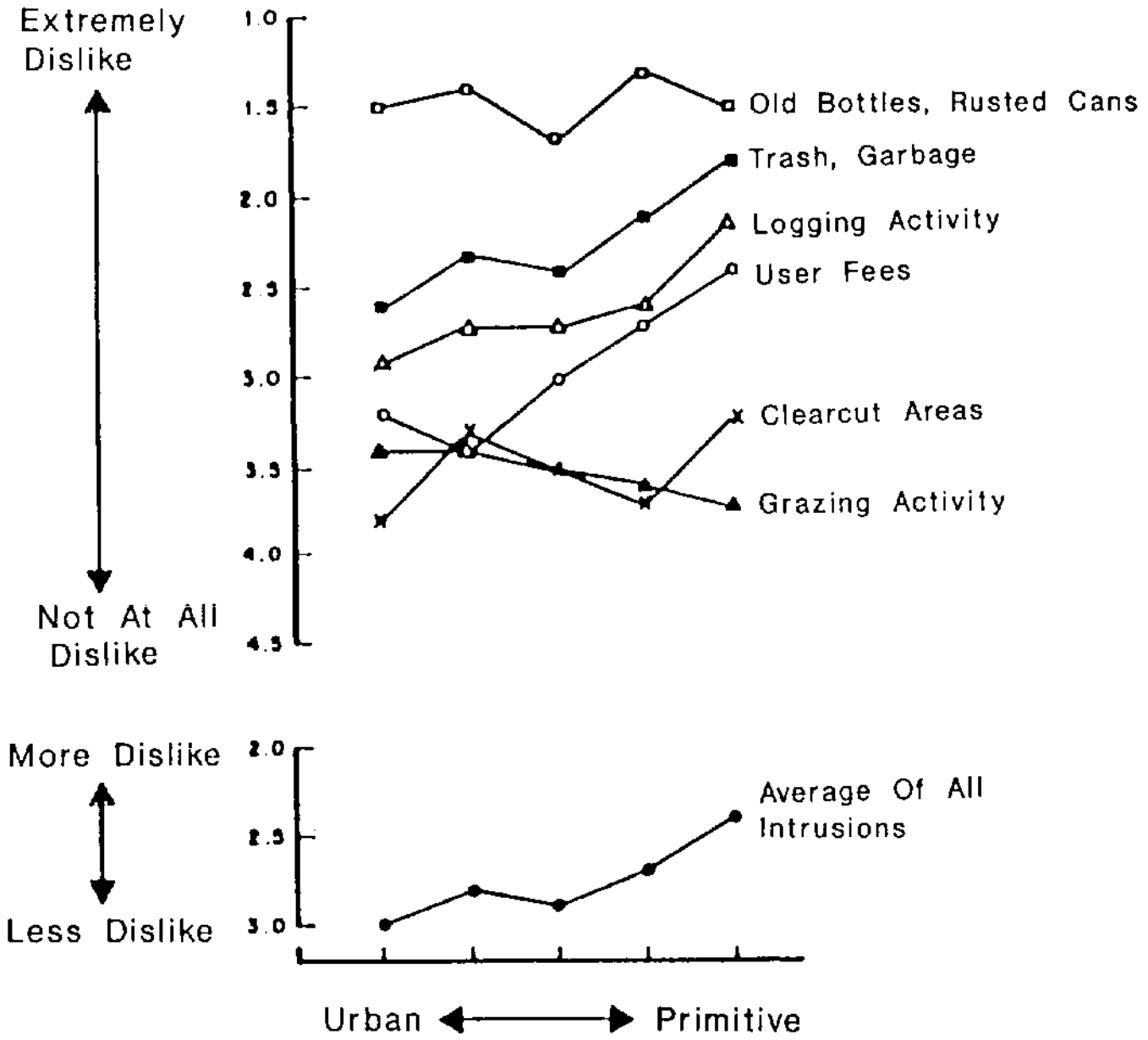

Figure 9.--**Average rating of human intrusions by Recreation Opportunity Spectrum category. Categories that differ by more than 0.3 are significantly different at the 95**

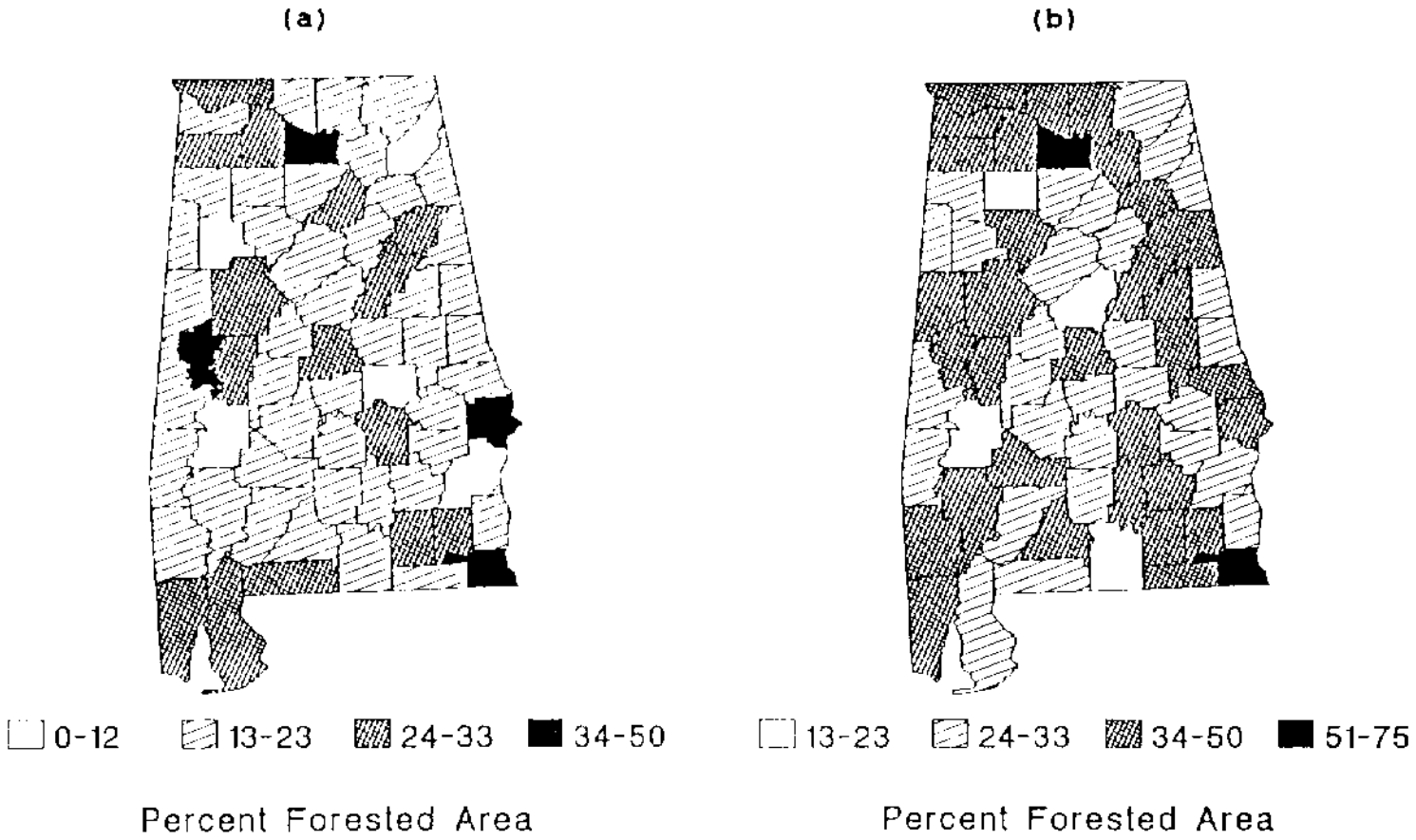

Figure 10.--(a) Timberland area with beverage containers by county, Alabama, 1990. (b) Timberland area with discarded artifacts by county, Alabama, 1990.

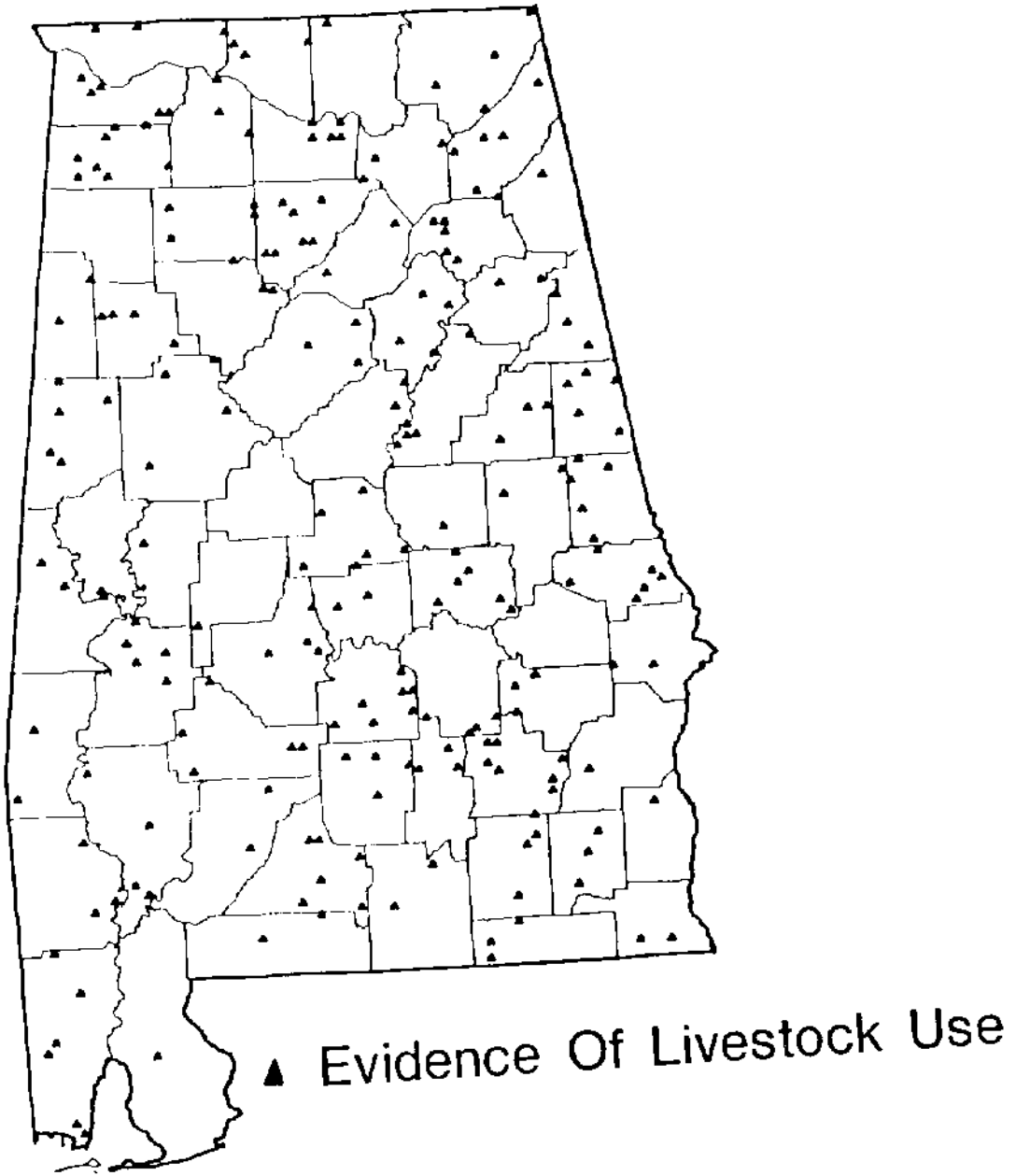

Figure 11.--Timberland sample plots with evidence of livestock use, Alabama, 1990.

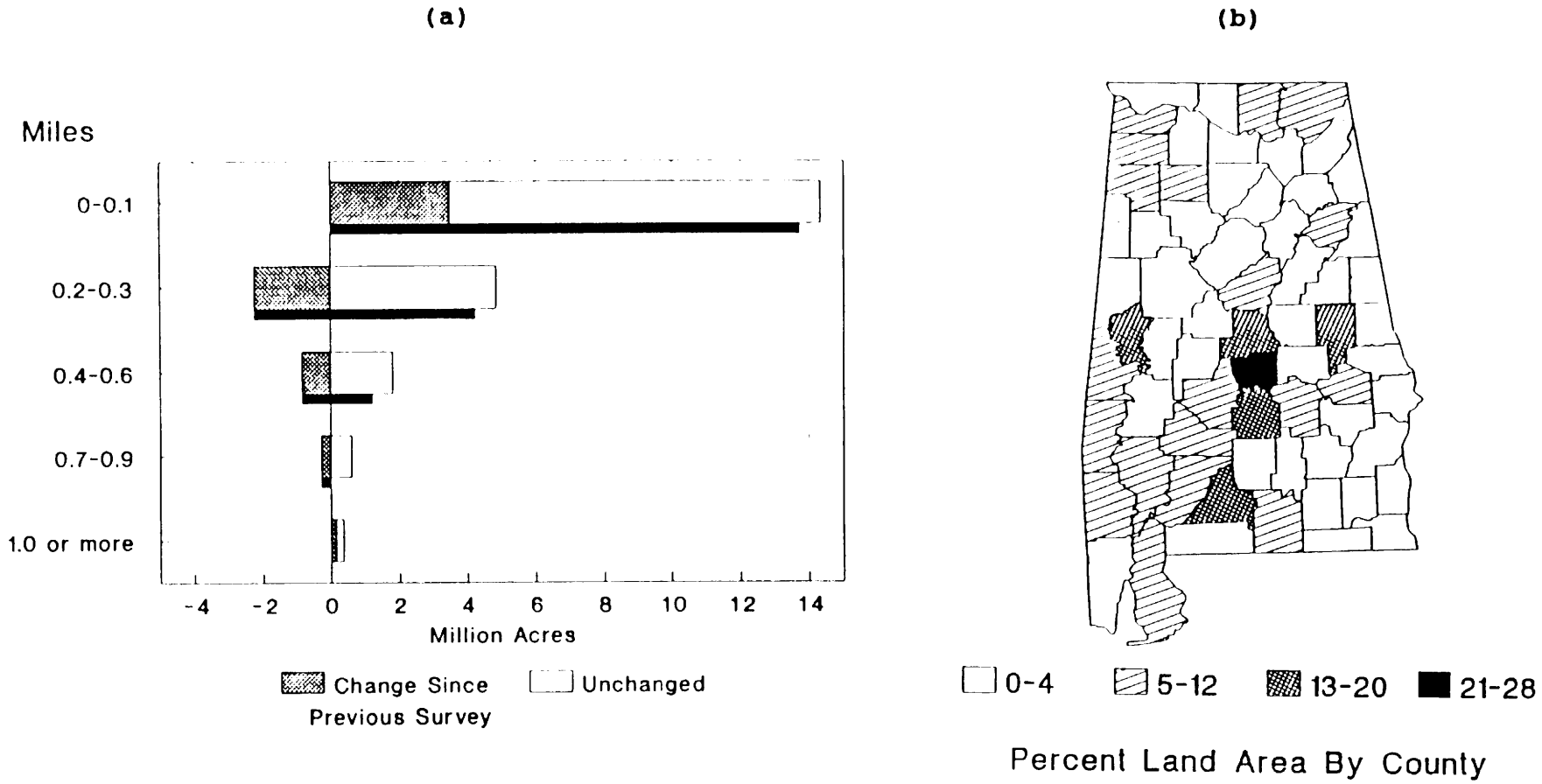

Figure 12.--**(a) Timberland area by distance from roads, Alabama, 1990, and change since previous survey. (b) Timberland area half a mile or more from roads by county, Alabama, 1990.**

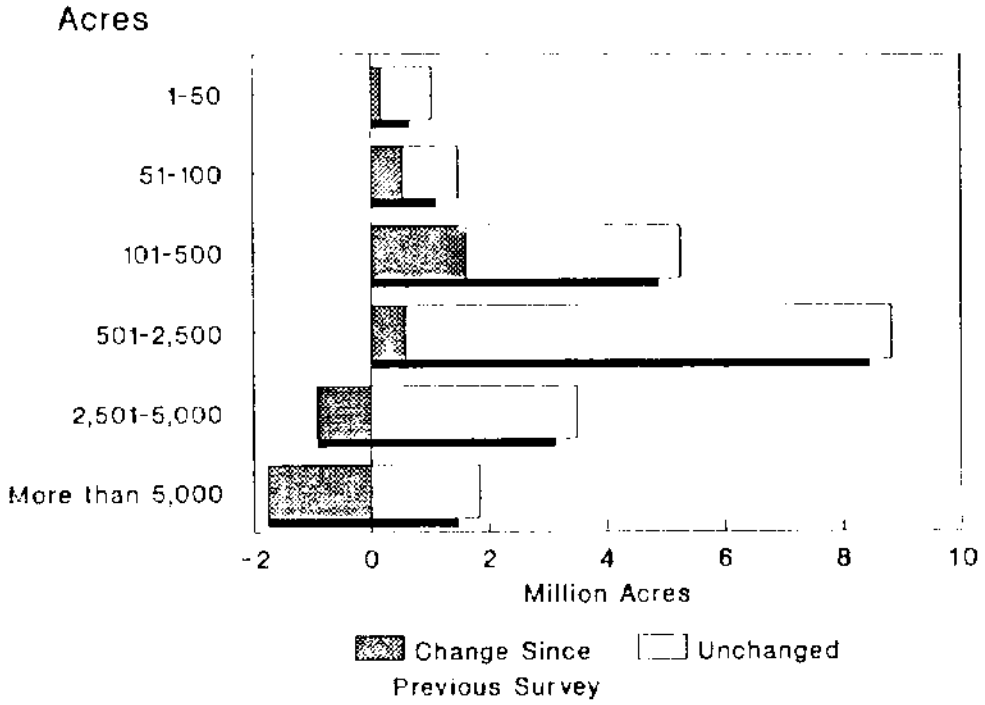

Figure 13.--**Timberland area by tract size, Alabama, 1990, and change since previous survey.**

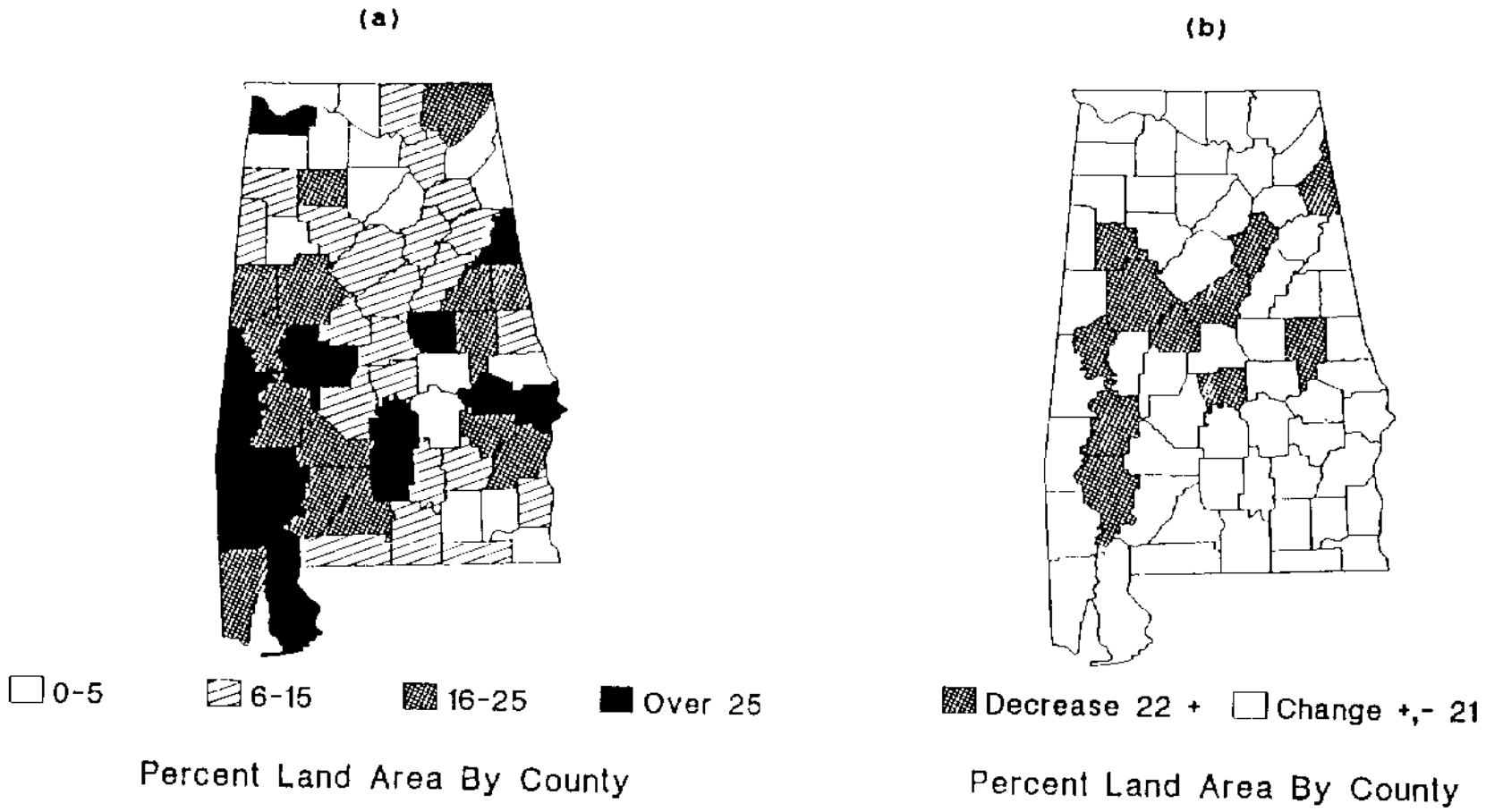

Figure 14.--(a) Timberland area in tracts 2,500 acres or more by county, Alabama, 1990. (b) Timberland area in tracts 2,500 acres or more by county, Alabama, 1990, and change since previous survey.

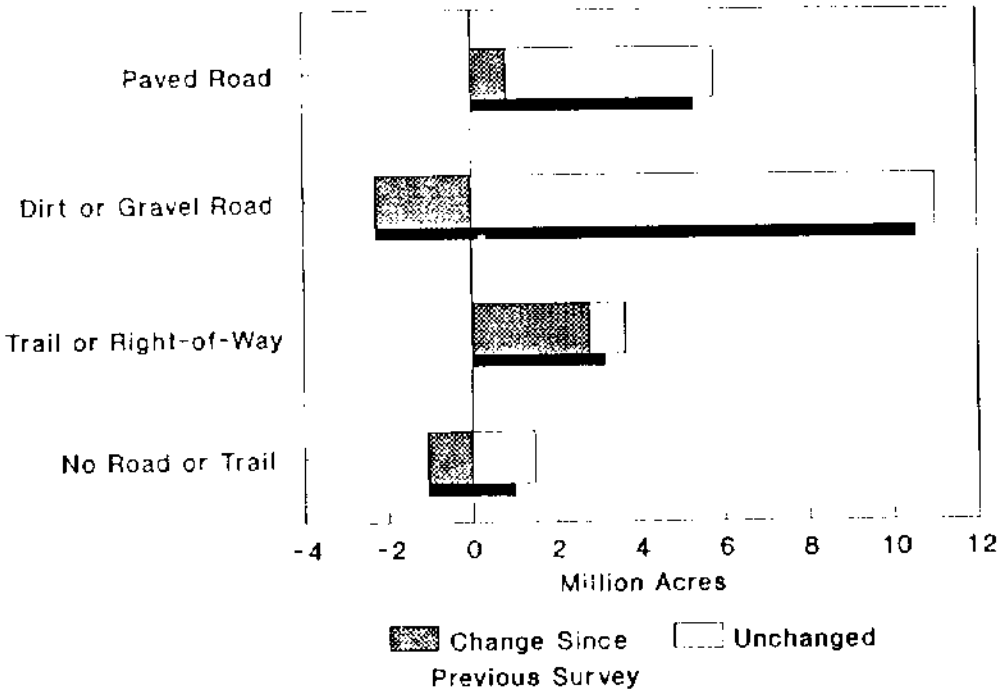

Figure 15.--**Timberland area by access condition within a quarter mile, Alabama, 1990, and change since previous survey.**

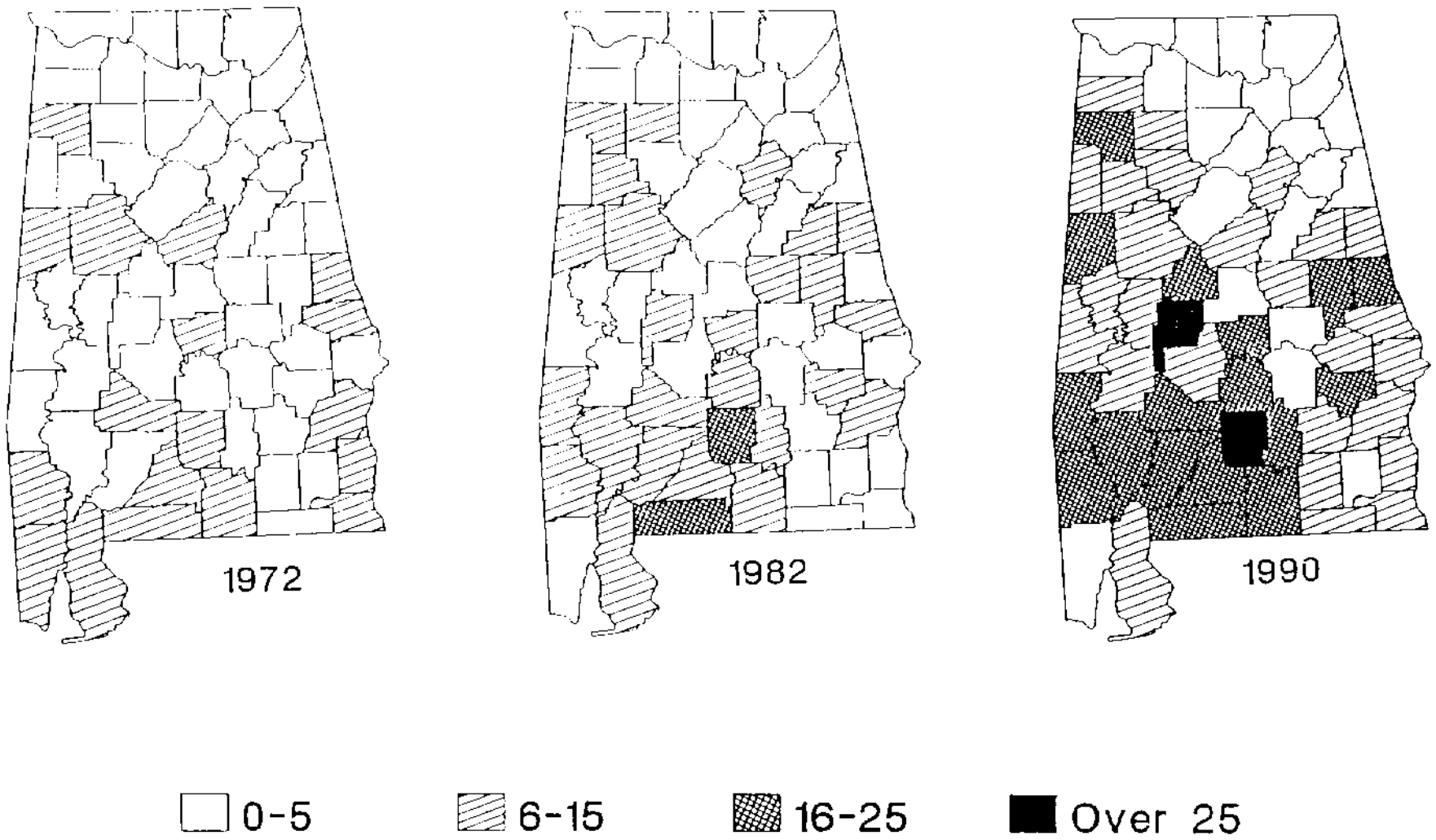

Figure 16.--**Pine plantation area by county and survey year, Alabama.**

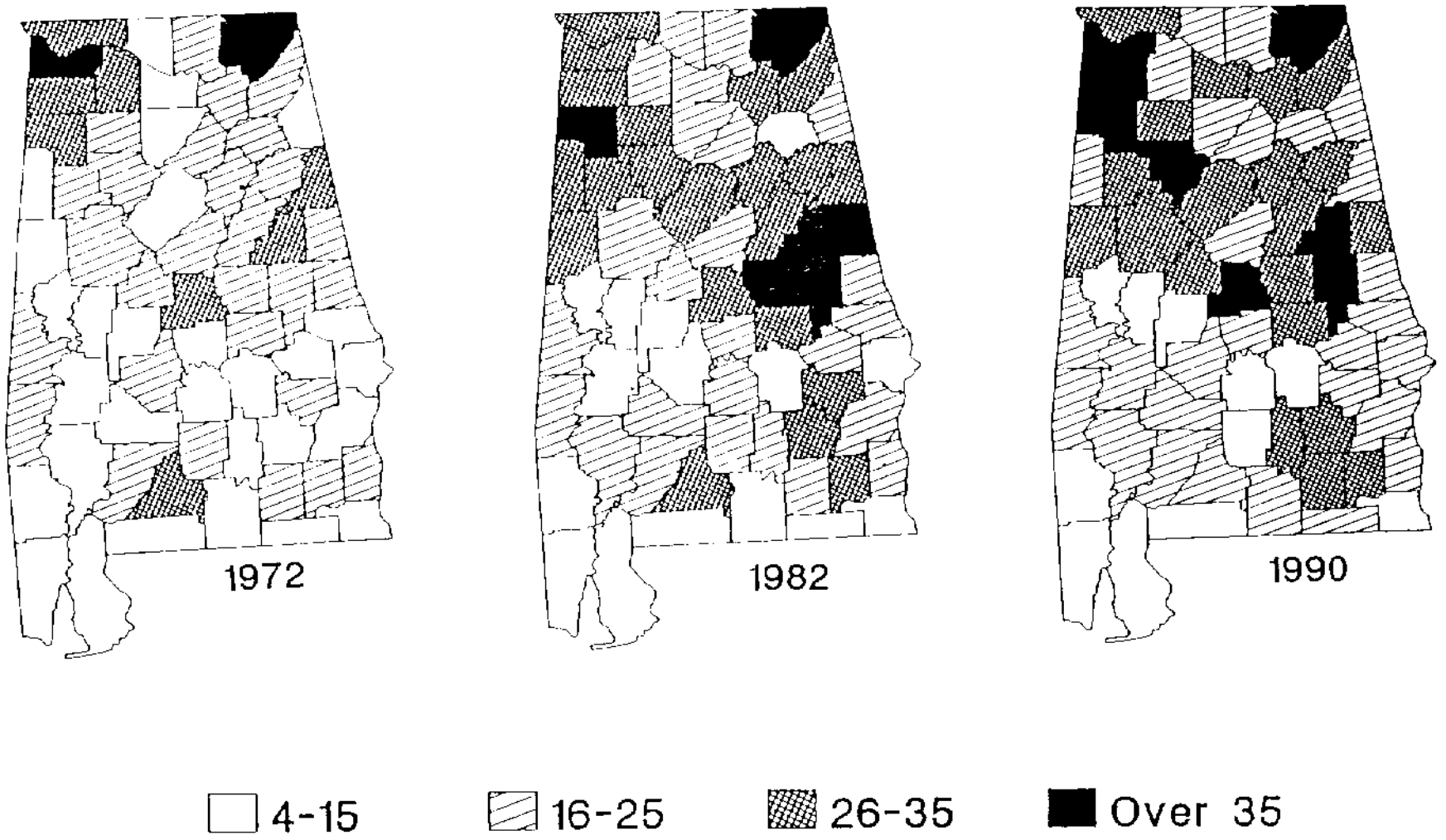

Figure 17.--Oak-hickory timberland area by county and survey year, Alabama.