

Land Use Changes Caused by a Quarter Century of Strip Coal Mining in Indiana

LEE GUERNSEY, Indiana State Teachers College

Strip coal mining production records for Indiana are complete since 1917, but only during the last 25 years have more than 40 per cent of Indiana's total coal production been derived from strip mining. From 1934 to date, the annual output from strip mining has exceeded 6 million tons (1). In recent years strip mining has produced from 3/4 to 4/5ths of all Indiana's coal output, and there are only six active underground coal mines left in Indiana.

Strip coal mining has taken place within 15 counties of Southwestern Indiana. Fifty strip mines are actively at work in Indiana but 4/5th of the current strip mine coal tonnage is produced in Warrick, Vigo, Pike, and Greene Counties (2). Most of the remaining 1/5th of strip coal tonnage occurs in Knox, Sullivan, Clay, Gibson, Owen, and Vermillion Counties.

No survey has been made of the areal extent of strip coal mining in Indiana except for G. A. Linstrom's article entitled "Extent, Character and Forestation Possibilities of Land Stripped for Coal in the Central States" published in 1948 by the Central States Forest Service (3). No recent measurements of the extent and land use impacts of strip coal mining have been made in Indiana. With the aid of a research grant from RESOURCES FOR THE FUTURE, the writer here presents a brief

LAND USE (ACREAGE)

COUNTY	LAND		TREES	GRASSES &	AREAS	
	STRIP	FORMER	ON	LEGUMES	USED FOR	IDLE
	MINED	CROPLAND	SPOILS	ON SPOILS	RECREATION	SPOILS
CLAY	18,295	14,015	17,280	250	1,900	660
GREENE	18,200	5,200	5,725	2,925	3,800	0
PIKE	16,104	7,604	3,385	0	333	12,485
WARRICK	13,265	5,682	9,949	0	260	3,316
SULLIVAN	8,303	3,669	5,800	200	2,430	783
VIGO	7,727	6,305	3,500	525	5,530	1,670
KNOX	2,825	2,525	325	350	70	1,775
OWEN	2,690	1,850	1,550	100	1,100	1,140
VERMILLION	2,340	800	1,660	0	1,200	1,140
DAVISS	2,218	1,915	1,450	0	1,400	720
SPENCER	890	440	280	0	280	550
PARKE	443	180	210	0	21	227
FOUNTAIN	380	310	300	0	0	60
OTHERS	156	0	156	0	0	0
TOTAL	93,836	50,495	51,363	4,350	18,324	24,685
% OF TOTAL	100%	53.8%	54.7%	4.6%	19.5%	26.3%

Figure 1

summary of recently compiled data on the extent of strip coal mining and of selected aspects of impacts upon agricultural land use in Indiana.

From measurements of aerial photos and topographic maps; estimates from Soil Conservation Technicians and County Agricultural Agents; and coal data from the files of the Indiana Coal Association, the total acreage of land strip mined for coal in Indiana is 93,836 acres (Fig. 1). In 1947, the Central States Forest Service measured 41,909 acres strip mined in Indiana. This represents a 233 per cent increase in strip mined acreage during the last 12 years.

Four counties have more than 10,000 acres of spoil banks (Fig. 2). About 70 per cent of all Indiana's spoil banks occur in four counties; Clay, Greene, Pike, and Warrick Counties have a total of 65,865 acres of spoil banks. Vigo and Sullivan Counties have another 16,130 acres and account for 17 per cent more of Indiana's spoils. Vermillion, Owen, Knox, and Daviess each have from 1,000 to 5,000 acres. Fountain, Parke, Martin, Gibson, and Spencer Counties complete the areal extent of spoil banks each with less than 1,000 acres of strip mine acreage. Since Linstrom's 1947 survey, Greene County has more than trebled in strip mine acreage; Clay and Warrick Counties have more than doubled, and Pike County has experienced a 50 per cent increase in spoil bank acreage. These four counties also contain the greatest estimated strippable coal reserves. According to a recent survey, 2,698,345,000 short tons of strippable coal remain in the six county area within which more than 5,000 acres of spoil banks are located (4). It appears that the large areas of strip coal mining in Indiana will grow larger and the others will become proportionally smaller. Clay County Soil Conservation officials estimate that 26,865 acres of strip mined lands will occur in Clay County by 1975. Therefore, in the future, the areal pattern depicted now will probably remain much the same; only the figures will change.

Of the 50,495 acres of cropland which have been stripped for coal, Clay County has lost 14,015 acres. Vigo, Greene, Pike, and Warrick Counties each have had from 5,000 to 10,000 acres of cropland stripped (Fig. 3). In all five of these counties significant sized farming areas have been taken over by mining operations. Since most of the land which was stripped has provided the owner with as much income from the recovered coal as it would have from agriculture for a decade or more, many owners have not hesitated about selling their cropland for strip mining. Some cropland has been strip mined in all the 13 major coal-producing counties.

In 1941, Indiana passed the first law in the United States which required the reclamation of all strip mined areas (5). Ten years later amendments to the original law were passed to include information secured during the 1941 to 1951 period. All reclamation is carried out under the administration of the State Forester's office.

Tree planting has been the most widespread method of spoil bank reclamation. Of the 51,374 acres of tree plantings on Indiana's spoils, about 50 per cent has been planted with such native deciduous species as sycamore, cottonwood, tulip poplar, ash, red oak, sweet gum, and soft maple. The other one-half consists mostly of White, Norway, Jack, Pitch and Virginia Pines. Clay County, with 18,295 acres in spoil banks, is the only county to have more than 10,000 acres of tree plantings (Fig. 4).

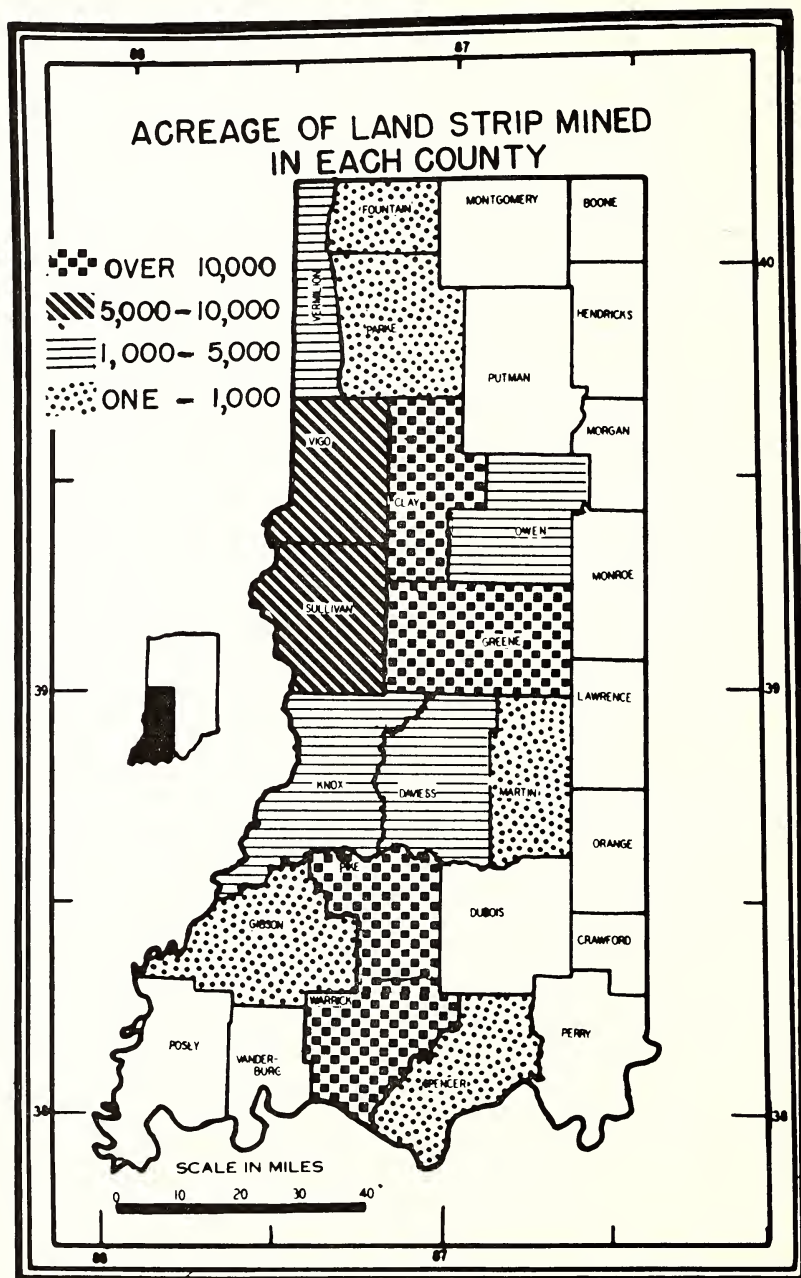


Figure 2

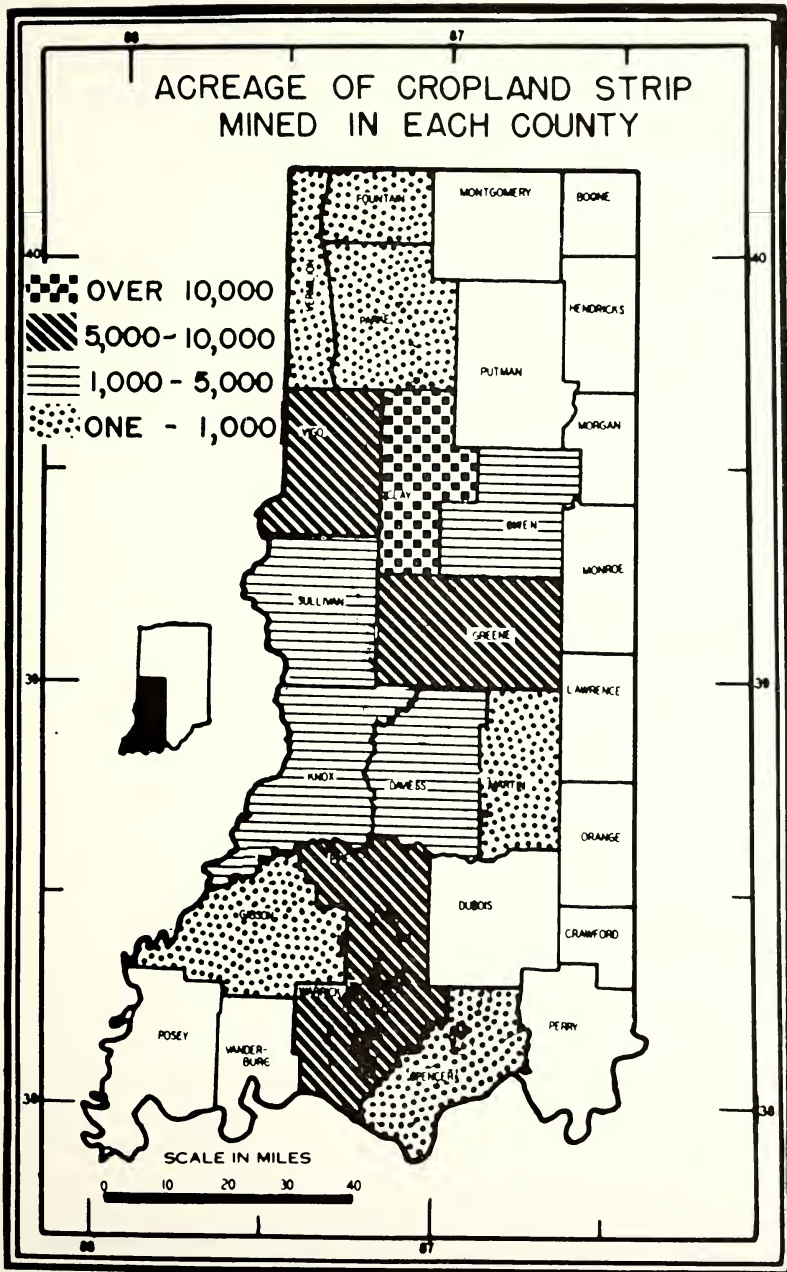


Figure 3

Greene, Sullivan, and Warrick Counties are the only other three counties to have more than 5,000 acres of trees planted on spoil banks.

Tree plantings usually cost less than other types of reclamation; they hide the unsightly banks quickly since they grow rapidly. They often provide an attractive cover, but to date they have had little marketable value, and reforestation is slow (6).

Grasses and legumes have been sowed on about 5 per cent of Indiana's spoil banks. Greene County, with 2,925 acres, contains more than one-half of all the state's spoils revegetated with grasses and legumes. Vigo, Clay, Owen, and Sullivan Counties make up the remainder of the 4,350 acres in grasses and legumes (Fig. 5). None of the southern counties have spoil material suited to the growing of grasses and legumes. The opportunities for successful reclamation by sowing grasses and legumes are greater in the glacial till areas.

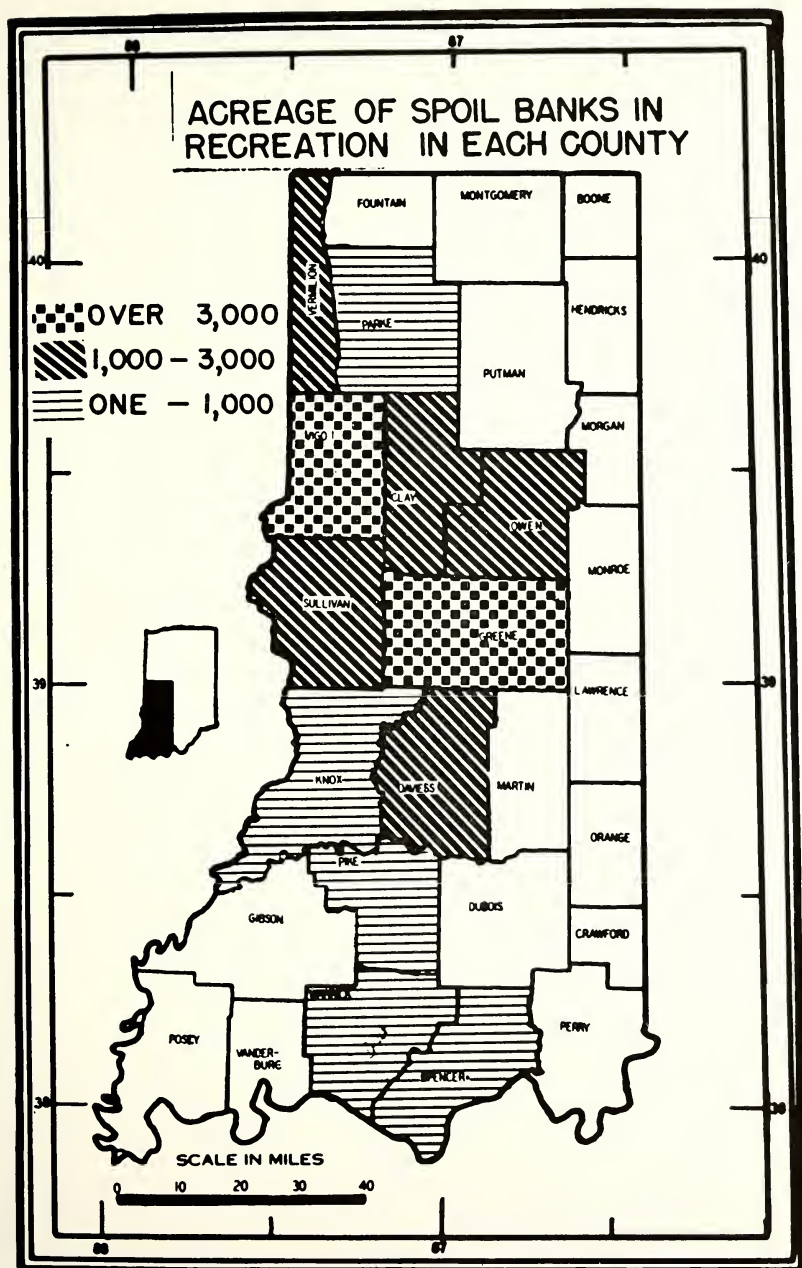
The soft shales of Greene, Vigo, Clay, Owen, and Sullivan Counties are also characterized by a higher pH reaction than the massive sandstones of the southern mining areas. In addition, there are usually more than one-half of the surface material with a diameter of less than .002 mm.

One large mining company has established a corporation called Meadowlark Farms, Inc., where spoils containing an abundance of calcareous material from glacial till are used for profitable grazing of hogs and beef cattle from sowed alfalfa and sweet clover. This same mining company also mines land in Pike County where they have acid, rocky sandstone spoil material. They are convinced that forestation is the most feasible use of their Pike County lands.

According to accumulated estimates from County Agricultural Agents and Soil Conservation Service personnel, 18,324 acres of strip mined lands have been developed or used as recreational areas in Indiana. Although this represents only 19.5 per cent of the total acreage, these areas represent a great asset from the standpoint of public utilization of strip mined lands. Vigo and Greene Counties have each more than 3,000 acres where private interests, sportsmen's clubs, and other individuals or groups have home or cabin sites and have developed recreational facilities from strip mined lands. Scales Lake State Park in Warrick County near Boonville is one example of a public recreational area and fish hatchery which have been developed from spoil banks.

Inasmuch as quail and cottontails are normally numerous on spoil banks with a good ground cover, an undetermined amount of strip mined land is used for hunting. Swimming, bluegill and bass fishing are common in strip mine lakes which are deep, long, and narrow resulting from the last box-cut. Smaller, shallower ponds created where the water table has risen above the bottoms of the valleys between strip mine ridges provide desirable environments for furbearing animals and waterfowl. Thus, from swimming, hunting, fishing, and trapping, strip mine lands are viewed as areas providing unlimited recreational opportunities.

The proximity to urban areas is a major factor in the location of recreational areas. Vigo, Greene, Vermillion, Sullivan, Clay, Owen, and Daviess are the counties within which more than 1,000 acres is considered recreational (Fig. 6). Southern counties are often inaccessible because of rugged terrain which most sportsmen find too difficult to hunt, fish, or



trap except along the county roads. But reclamation developments in Indiana have demonstrated that the recreational possibilities of strip mined lands is far from being realized.

Twenty-six per cent of Indiana's spoil banks are idle. Of the 24,814 acres still idle, about 60 per cent is located in Pike and Warrick Counties. The idle land occurs for two primary reasons: (1) Spoil banks which are being weathered in preparation for grading and planting. (2) Spoil banks which are 18 years old or older and were mined before reclamation was legally required. With the combined impact of these two factors, idle lands are prevalent in most Indiana counties (Fig. 7).

Only 364 acres of strip mined lands were reported as tax delinquent in 1959. This represents less than one-half of 1% of all spoil banks. Spoil banks are normally held onto in Indiana because the owners are aware of the numerous potential land uses to which they can be put after the coal is removed. In addition, the possibilities of mining the deeper coal seams later cause mining companies to retain the land (7).

In conclusion, there is significance in the extent and wide variety of different land uses of Indiana's spoil banks. The mining of 50,495 acres of cropland has caused numerous impacts to those farming areas. Within Southwestern Indiana, 93,836 acres of land have been converted to spoils. They have certainly created considerable economic instability in those areas primarily affected.

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