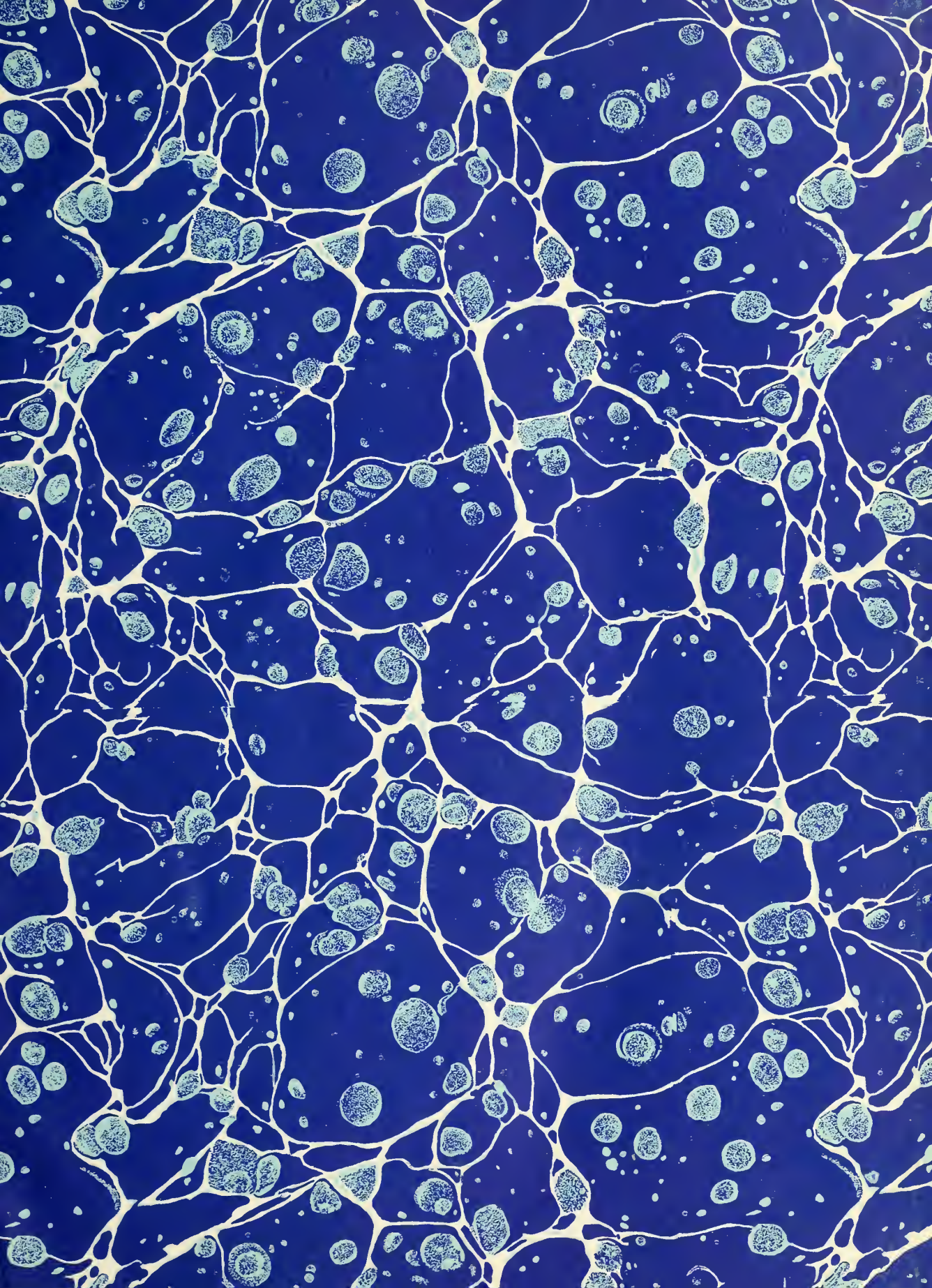

Resettlement Administration
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LAND CLASSIFICATION:

Objectives and Requirements

by

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Washington, D. C.

Errata:

P. 20: Word "CONSIDERATION" in topic heading should read "CONSIDERATIONS"

P. 23: Paragraph 3, last line, "consideration" should read "considerations"

P. 30: Paragraph 3, next to last line. (referred to on p.) should read (referred to on p. 10).

P. 31: Line 2. "and occasional instance" should read "an occasional instance" Paragraph 1, line 2, "than in certain districts" should read "that in certain districts."

P. 34: Paragraph 2, line 4. "their omission will save them", should read "their omission will save time"

LAND CLASSIFICATION:

OBJECTIVES AND REQUIREMENTS

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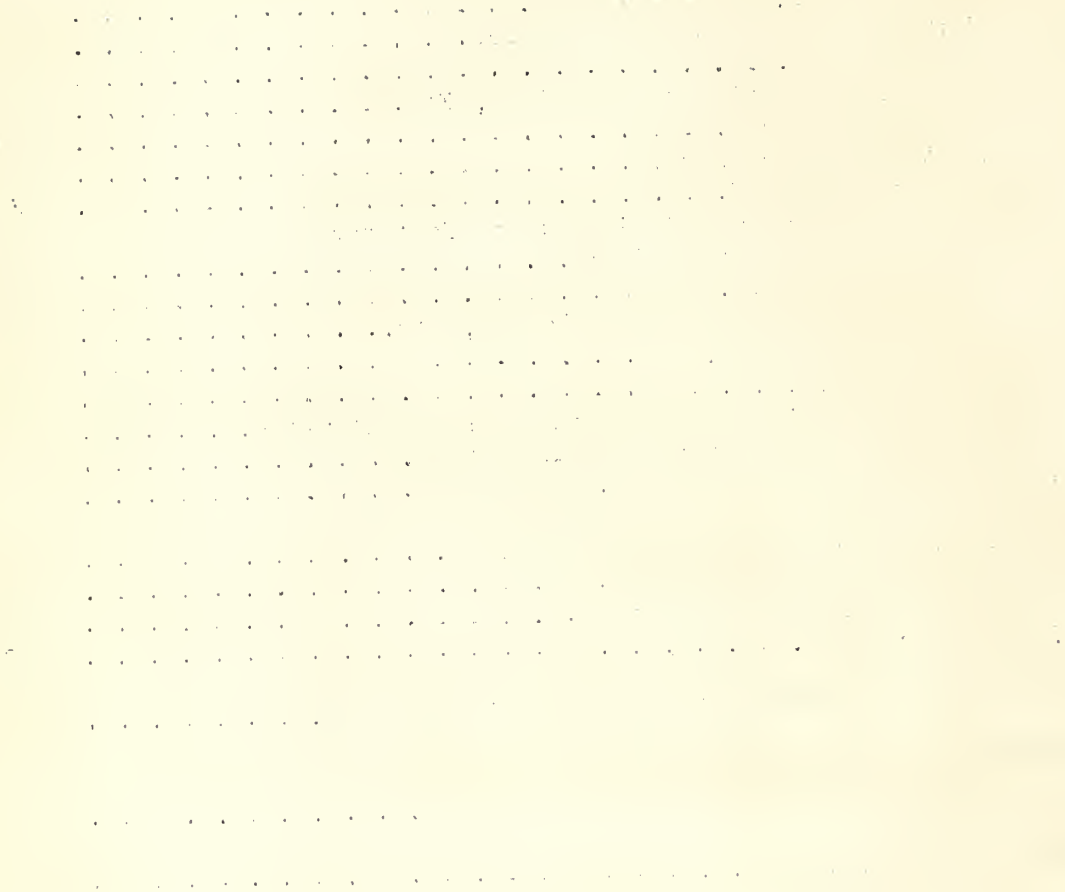

INTRODUCTION

By classification is meant the process of placing cases or objects into categories, the better to compare their characteristics and to accord similar treatment to similar cases or objects. Land classification consists in placing definite bodies of land in categories which help us compare their characteristics and treat similarly bodies of land having similar characteristics. Thus placing land in classes according to slope, present use, elevation above sea level, or average distance from Peoria, Illinois is properly called land classification if that term is broadly defined.

In land-use planning, however, land classification has a more specific meaning. Here, it is generally understood to mean the placing of bodies of land into classes which are described in terms of their use-capabilities. Even following this more specific definition, land classification may take a variety of forms. Bodies of land may be classified as to their relative suitability for some use, as is the case when soil types are graded according to their productivity for agriculture or for given crops. In other cases bodies of land may be classified in such a manner as to indicate the enterprises or types of operating units for which the lands are suited or unsuited. The classification may deal with natural bodies of land, such as soil types, the distinguishing characteristics of which are those of the natural or physical environment, or it may be concerned with cultural bodies of land, such as farms, ownership units, or the forty acre tracts of the rectangular land survey, of which it attempts to indicate the difference in use capabilities.

The bodies of land classified may be, in still other cases, neither wholly natural nor cultural, but may be delimited by considerations, both physical and economic, which determine the types of operating units which are desirable. An area with the proper combination of soil, surface configuration, climate, and proximity to a city to make it especially desirable for part-time farming, market gardening, or poultry farming would be an example of such a body of land. It might differ from one adjoining area in having soil and surface suitable for these agricultural enterprises, and from another in being close enough to the urban

center to make such intensive use desirable.

Each of these forms of land classification has merit in serving particular purposes. Classification of farm ownership units according to their agricultural productivity for example, may serve the purpose of achieving an equitable appraisal for taxation. In order to make such a classification of ownership units more scientifically and with greater precision, it might be desirable first to classify, according to their productivity, the natural land types or bodies of land of which the ownership units are composed. In this case one type of land classification serves a second type, and so indirectly serves the purpose for which the second type is executed. The form of land classification which is concerned primarily with suitability of types of operating units, to the land, we shall call, for convenience, use-district classification.

The form of land classification to be used in a given case will be determined after consideration of the objectives which land classification is expected to serve.

OBJECTIVES OF LAND CLASSIFICATION

If land classification is to be advocated in a given situation or area, it should be because it serves a rather specific and definite purpose. A more definite objective than that of "achieving a sound use of land", or adjusting land use to land character, will generally be needed to justify a land classification project and to indicate what its form and requirements will be. Indeed, a clear and definite statement of the purposes for which a proposed land classification project is to be undertaken, will do more to show what sort of procedure should be followed than any treatise on methods that could be prepared. The objective of guiding land settlement and occupancy through zoning, for example, dictated the establishment of land classes or use districts in northern Wisconsin counties and indicated the form which the land classes, or use districts, should take. It is necessary, therefore, to consider the various objectives, rather specifically defined, which land classification may serve, without denying of course that it may serve such broad general objectives as attaining the best use of the land, which is in itself only a means toward best serving the general welfare. It will be found, however, that land classification may serve purposes -- such as the equalization of tax assessment, and the prevention of losses through credit extension or investment -- which, although contributing to the attainment of the best use of land, have more direct usefulness in the conservation of capital.

Land classification may serve two broad types of objectives; namely, (1) those involving the formulating of land use policy, and (2) those concerned with the carrying out of particular policies with respect to land-use. The following will illustrate the difference: (1) To help formulate policies with respect to land-use in distressed dry-farming areas of the Great Plains, it is desirable to know approximately the character and distribution of maladjustments in land-use in the region, and to know something of the characteristics and fitness for use of the land with respect to which some policy needs to be taken. This requires some differentiation or classification of the region according to the magnitude of its land use "problems", and according to the character of the land as it bears on possibilities and nature of adjustment. (2) Having determined on some policy such as replacing uneconomic grain farming by a combination of individually operated stock ranches and publicly owned grazing districts, to be accomplished by public acquisition and lease to private operators, it becomes necessary to identify those particular lands which are to be acquired, and to differentiate between those to be operated as individual stock ranches, and those to be used in common as grazing districts by nearby ranchmen.

The objective of formulating a policy may be served by any type of land classification which improves our understanding of the situation which is to be dealt with. A reconnaissance or sampling type of classification might thus improve our understanding. In carrying out a policy, on the other hand, the classification must deal specifically with all the bodies of land in the area within which the policy is to be carried out.

The following objectives of land classification will be attained primarily through the application of policies. The direction of land settlement and the equalization of tax assessment are thus examples of policies in whose carrying out land classification may aid.

Many of these objectives are closely related. Accomplishment of one will often result indirectly or incidentally in the attainment of others.

Direction of Land Settlement or Land-Use Through Zoning

The establishment of districts or "zones" in which certain detrimental uses of the land are to be legally discouraged is a

process of land classification. Before any area may be "zoned", the land on it must first be classified according to the uses which may or may not be permitted on it. Zoning as it is commonly understood is a preventative of uses inimical to the public welfare. Rural zoning has been used as a device to prevent land settlement from occurring in such a manner as to waste public funds. Its use to prevent other types of undesirable land use has been advocated.

Land classification, in establishing the districts to which zoning regulations are to be applied, will be concerned with the identification of undesirable uses for specific bodies of land. It may be that, in order to serve this purpose, no identification of desirable uses, except by inference that all uses that might be undertaken and are not specifically found to be undesirable, are desirable. It will necessarily involve examining and, as far as possible, mapping all evidence indicating that certain land uses, likely to be carried on in the areas, are undesirable, not alone from the viewpoint of the individual, but from the viewpoint of the general welfare. Such evidence may consist of items like farm incomes, living standards, crop yields, waste of public funds through excessive public service costs, use of public "outdoor" relief, tax delinquency, etc., all of which are related to existing uses of the area. In the case of newly settled or unoccupied areas, where evidence of this sort is insufficiently abundant, determination of undesirable uses will depend more completely on our understanding of the utility of the types of land to be found in the area as developed through experience with types elsewhere having similar characteristics. It is known, for instance, that coarse, sandy soils are so undesirable for grain or grass crops, that it is everywhere unwise to clear them of timber in order to undertake types of farming dependent on such crops. Agronomic information is strongly indicative of the undesirability of the use of certain types of land for certain purposes, and in such cases it is not necessary to have had actual experience with every body of land in an area in order to reach tenable conclusions that certain uses are undesirable.

The understanding of the relation between land characteristics and capabilities, possessed by agronomists, soil scientists, land economists and other technicians is not shared by the general public, nor by all those individuals choosing land for agriculture or other rural use; hence the usefulness of land classification in indicating undesirable uses of specific bodies of land.

Land classification for zoning which sought only to prevent the future extension or introduction of unwise use and did not, therefore, undertake to effect changes in use, would not necessarily need to be concerned with alternatives to such present uses as are

undesirable. In practice in Wisconsin, rural zoning provides not merely for prohibiting the extension or introduction of undesirable uses in districts in which use is regulated, but for the gradual elimination of present undesirable uses by preventing their re-introduction after they have been discontinued. The effect of such replacement of use on local governments and their services will, of course, need to be anticipated in making the land classification in such cases.

Direction of Land Settlement Through Real Estate License Laws

Much ill-advised purchase of land for agricultural enterprises could be avoided if selling agents were required to place in the hands of prospective purchasers an official report setting forth the use capabilities of the land in question. In California the law requires prospective purchasers of land in a subdivision to be supplied with a report on the character of the land and its suitability for the uses to which it is advertised as being adapted.

In much of the country no systematic body of information about specific lands is to be had, and in very few places is there any official recognition of desirable or undesirable uses, or statement of use-capabilities, that may be drawn upon for the benefit of prospective buyers. It is particularly difficult for real estate license law officials to obtain information on the character of lands in land-selling and development projects, if these lie outside their own State and jurisdiction. Land classification, setting forth in some measure the use-capabilities of specific lands, carried out by and bearing the stamp of an official technical agency, could be used by license law officials in providing unbiased information on the adaptability of land in other States as well as in their own. The practice carried on in some sections, of selling as farms, properties too small to provide a living by farming, even though containing land suitable for farm enterprises, calls for a type of land classification in which the minimum size of an economic unit of operation is indicated.

Direction of Land Settlement Through Publicizing Information

Even in the absence of zoning and without the use of real estate license laws, land classification can effectively aid in giving direction to private land settlement by merely placing an official stamp of approval or disapproval on the use of given areas

for specific purposes. There is little doubt that the amount of injudicious settlement in the northern Lake States, in the Great Plains and elsewhere, would have been less if there had been, publicly available, reliable information regarding the use-capabilities of the land, such as those provided by the use-district type of land classification. Such recommendations carry much weight with prospective land purchasers. Land classification, properly to serve the purpose of guiding land settlement, must have as a minimum requirement, a statement or clear implication of the undesirable types of operating units for each district.

The objectives discussed up to this point have been those of giving guidance to whomever, for any reason, may undertake to find new homes or farms in some particular region. In classifying land for this purpose, the considerations are concerned wholly with the character and opportunities offered by the areas in which land settlement is likely to take place. The questions to be answered are: Where are there good and where are there poor opportunities for livelihood from particular types of operating units in this area? No comparison of opportunities offered by lands in the area in question with those offered by occupations or lands previously supporting those undertaking settlement can be made, because no one knows from what occupations or places prospective settlers will come.

Guidance in Publicly Assisted Population Redistribution

It has recently been recognized that there are numbers of rural families which public agencies are justified in assisting to relocate, because, in addition to offering an inadequate livelihood, their present situation results in waste of public funds through the excessive cost of providing governmental services or relief or both.

Public assistance to rural families in transferring from unproductive farm land to situations offering greater opportunity presumes land classification which will identify both the areas offering inadequate livelihood and the areas offering sufficiently greater opportunity for livelihood, or for greater efficiency in the use of public funds, to justify the transfer. There are, of course, some cases in which the undesirability of the present type of occupancy is so obvious, and the superior opportunities offered by better land nearby are so easy to demonstrate, that the land classification may proceed to identify them without much fear of error. There are, however, other cases in which the desirability of relocation, or in which the identification of lands upon which families should be relocated, involves considerations of social

and economic factors, (some of them lying outside the areas in question), the effects of which are controversial and difficult of anticipation. It must be recognized therefore that it will not in every case be possible to identify areas to which destitute rural families should be shifted, nor in fact to demonstrate that they should be shifted at all under the conditions of the moment. Certain forms of land classification, however, as for example, the classification of land types or soil types according to their productivity for various uses, even though not definitive, may prove suggestive.

Guidance in Public Land Acquisition

Aside from the provision of certain public facilities, such as highways and parks, public acquisition of rural lands has been mainly limited to forest lands which are agriculturally uninviting. If a policy of public land acquisition to forestall further loss of capital through injudicious attempts at agricultural utilization, or to prevent practices inimical to the public good, is to be followed, land classification is necessary to determine on which lands public acquisition would be most effective in accomplishing these ends. The land classification program under way in New York has, as one of its immediate objectives, the designation of areas most suitable under the state forest acquisition program, for public purchase. Aside from the provision for public forests, such acquisition will assist in preventing further loss to individuals through unwise occupancy of poor farm land. Public land acquisition may be a feature of publicly assisted population redistribution.

In some places, land has reverted to public ownership because owners have anticipated low income and because tax assessments were poorly adjusted to land income. It will be the function of land classification to determine which of such lands should be returned to private ownership in the interest of the common good, and which should be retained in public ownership for specific public uses.

Land classification which has as its immediate objective the determination of lands particularly suited to public ownership must consider the possible effect on local governmental finances and local service requirements which such ownership would entail.

Planning the Distribution of Public Services

Closely associated with redistribution of population, direction of settlement, and public land acquisition, is the matter of provision of adequate, but not redundant roads, schools, and electric power and telephone lines. Requirement for these services depends on the pattern of population. Ability to pay for them, on the other

hand, is more closely related to the productive capacity of the land. If, through land classification, we can improve our understanding of the capacity of the land to support population and public services, we shall be better able to anticipate the population and plan the distribution of needed services.

This will, of course, apply more particularly to sparsely settled areas. In certain sparsely settled areas the presence of roads and schools may serve as an inducement for families to occupy land which, in the public interest, should not be occupied. The mere presence of a road or school may make an otherwise impossible occupancy tolerable, particularly if the beneficiaries of such facilities do not themselves have to bear their cost. An additional inducement to remain on land which should be unoccupied is provided if the occupants derive a substantial part of their living from working on roads serving only themselves, or from carrying their children to school. On the other hand, there are still sparsely settled areas suitable under certain conditions for denser occupancy, and in these the presence of roads may facilitate this occupancy to the public benefit. The difference between these two types of unoccupied areas should be determined by conscious classification rather than by a process of trial and error in use.

Guidance in the Distribution of Subventions

Planning for efficient use of grants-in-aid is, of course, part of the problem of planning the distribution of population and public services.

State grants-in-aid for the support of local roads and schools may be justified in many rural sections in the interest of raising throughout the State the level of what may be considered general welfare functions. When, however, such grants are applied to aid services which are excessively costly per family served, and appear to be subsidizing an undesirable community pattern, it is likely that they could be spent to better advantage elsewhere. It is possible that land classification which helps to distinguish undesirable patterns of occupancy, might thereby help to improve efficiency in the use of grants-in-aid.

Guidance in the Distribution of Public Relief

Grants for drought relief can be justified if they are required to meet an extraordinary situation. If the need for drought relief in an area arises so frequently as to become a chronic demand, however, it is possible that public funds would be saved by transferring

the recipients of such relief to places not chronically affected with the cause of their distress, drought. If a chronic need for public relief arises because of ill-advised types of occupancy of certain lands, it would seem to be in the interest of the general welfare to assist in correcting such occupancy. It is a function of land classification to distinguish between areas in which public relief may be justified to meet an extraordinary situation, and those in which the population is likely to require chronic public support.

Planning the Reorganization of Local Political Units

Insofar as it may help us to anticipate community patterns and public service needs, land classification may be indirectly indicative of changes in the size and organization of local political units which may be desirable.

Guidance in Land Investment

Land classification may be used to provide guidance in land investment in much the same way as it helps to give direction to land settlement. Since much land investment is incidental to land settlement, guidance of one is in some measure tantamount to direction of the other. There occurs, however, loss of capital through unwise investment in rural land, aside from losses incurred in farm operation or injudicious settlement. The sale of small acreages to persons unfamiliar with the land and its capabilities, and in many cases, to residents of a distant part of the country, often takes place at prices unjustified by the productive capacity of the land. In some cases the use-capabilities of the land are incorrectly represented to prospective buyers who have no recourse to reliable and easily available information bearing on the soundness of the investment. Land selling agencies frequently advertise and sell in one State, properties located in another State, which license law officials in the State of sale could not easily examine and report on even if they were authorized to do so.

Land classification, carrying official statements of use capabilities, would enable license law officials to check representations as to the character and utility of land made by land selling agencies against officially supported information provided by technical agencies of their own or other States. Having recourse to such official sources of information on land character, gathered irrespective of the operations of any particular land selling agency, they would be relieved in some measure of the charge of bias sometimes

brought against them when reports are based on ad hoc investigations of lands advertised by particular agencies.

Guidance in the Extension of Credit

The safety of loans on rural property depends in considerable measure on the productive capacity of the property. Studies by Mereness 1/ in southeastern Alabama revealed a much greater percentage of foreclosures on some soil types than on others, despite the fact that those showing the higher percentages had been recognized as poorer by the appraisers and accorded lower loan values. Appraisers had apparently overestimated the productive capacity of the poorer land types. Land classification, by systematically providing information concerning the productive capacity of specific lands, helps to achieve safety in the extension of credit to rural land proprietors. 2/

The use of feed and seed loans in localities where their repayment is made improbable by chronically meagre incomes, can be avoided, and their restriction to localities needing them only because of an extraordinary situation, can be effected if the distinction between these kinds of localities is established by land classification.

Equalization of Tax Assessment

The assessment of rural land for taxation according to its productive capacity requires the classification of land in such manner as to establish a rating or index of the productivity of each property. Appraisal of farm land for taxation on the basis of the superficial evidence of income or productivity places a penalty on good management by putting a higher tax on well kept and prosperous looking farms which owe their prosperity to superior management, rather than to more productive land. The land classification carried out in several counties in western North Dakota had as its principal objective the assessment of land according to its productivity.

Guidance in the Use of Erosion Control Measures and other Management Practices

The classification of specific bodies of land of different types

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1/ Mereness, E.H. Farm Mortgage Experience in Southeast Alabama. Ala. Agr. Expt. Sta. Bul. 242, Jan. 1935.

2/ An agricultural implement company has used the classification maps of the Great Plains made by the U.S. Geological Survey in attempting to gauge the safety of extending credit in connection with the sale of farm machinery.

in terms of the measures which most economically minimize erosion would doubtless be useful in making farm management plans that would serve the end of land conservation. The function of land classification in this case would be to apply information developed by soil and plant scientists and erosion control technicians on the erodability of land under various treatments to specific bodies of land on individual farms, considering fully the effect of various erosion control measures on farm organization and income.

Guidance in the Reorganization of Type and Size of Operating Units

There are generally conceded to be areas of considerable extent within which some adjustment in the type or size of operating units is desirable, mainly in the interest of land conservation or adequate family living.

The determination of the nature of these desirable adjustments involves consideration of the many factors which bear upon the selection of economic units of operation for given types of land. These considerations include not merely the fitness of the land for various combinations of enterprises, including the effect of these various enterprises on the maintenance of fertility, and the acreage required to permit sufficiently large business to give efficiency in operation. In addition, the effect of an adjustment upon displacement of population and upon community pattern and public service requirements, as well as upon the revenues and maintanance of local governments, must be anticipated. The general economic outlook particularly as regards land requirements for different commodities, and also the availability of non-farm employment to absorb the surplus labor accumulating in rural areas through the natural increase of population, will also need to be considered because of its bearing on the livelihood of population that might be displaced by a projected adjustment in land use.

In encouraging adjustments in type of land operating units, it is ridiculous to suppose that exactly the same adjustment would be desirable throughout a large region. Local differences in types of operating units, and in the character of adjustment will almost invariably be necessary. To the extent that differential treatment must be accorded different districts, an element of land classification must be present in planning land-use adjustment.

RELATION OF LAND CLASSIFICATION TO PRODUCTION CONTROL MEASURES

While land classification will not in itself serve the purpose of agricultural commodity production control, adjustments in crop acreage for production control can advantageously be made to serve other objectives as, for example, the mitigation of soil depletion.

This calls for differential treatment of areas or even localities, or land types. In this differentiation, land classification is inherent. The regional adjustment project recently undertaken by the A.A.A. in cooperation with State Agricultural Experiment Stations is in some measure an attempt to make agricultural adjustment serve the purposes of production control, soil conservation and more efficient farm management.

FORMS OF LAND CLASSIFICATION

The form and requirements of land classification to be chosen depend in large measure upon the objectives it is expected to serve. A method of land classification which would adequately serve the establishment of use zones of the sort delineated in the zoned counties of northern Wisconsin, might be quite inadequate to provide a scientific basis for making tax assessments in relationship to land productivity.

A single type of land classification, however, may well serve several of the objectives just listed, in particular the group of closely related objectives which center around the distribution of population.

In general, the finer the distinctions between land types and their use-capabilities and the more detailed the mapping of land types, the greater the number of purposes which the land classification will serve. For example, the detailed mapping and evaluation of land types required as a basis for assessment equalization will also serve at least indirectly, most of the other objectives of land classification, but use districts for rural zoning may be established, in many cases, with less precise data than would be required for tax equalization. This might seem to imply that land classification should be carried on everywhere in such manner as to serve all probable objectives. As in most other activities, however, the benefits should be weighed against the cost in each instance.

If human misery can be avoided or important resources conserved through the direction of agricultural settlement, made possible by a type of land classification which could be carried out without too time-consuming a procedure, reason would dictate that it be undertaken, even though the most precise information about the land be not obtained. It is reasonable to expedite classifying certain areas as undesirable for agricultural settlement, when the evidence indicates this to be the case, even though precise information on the character of each acre may be lacking. Subsequent refinement in the treatment may be undertaken as the occasion demands, or as time and finances permit.

On the other hand, it should be recognized that the more accurate and complete the body of information supporting a classification, the

more explicit can be the statement of use capabilities, and the smaller the likelihood of injustices arising from mistakes or from too broad generalizations.

Classification of Natural Land Types

A land type consists of all the land possessed of a given set of characteristics. A soil type is one example of a land type, since it consists of all the land having a given set of soil characteristics. Natural land types may, of course, be differentiated by characteristics of climate and surface configuration, and by location, size and shape of individual bodies, as well as by soil characteristics.

The identification and mapping of land types has this important usefulness in land classification: Experience or experiment in the use of a portion of a certain land type enables us to evaluate the use capabilities of the other portions or bodies of land of that type. In the absence of this differentiation of land areas into types on the basis of their characteristics, we should have to have experience in the use of each body or parcel of land before we could evaluate its use capabilities.

The systematic differentiation, mapping, and description of natural land types on the basis of their soil characteristics carried on by the Federal Bureau of Chemistry and Soils, in cooperation with State Agencies, provides an important body of information on the characteristics of land types. By relating the records of land-use experience, such as crop yields, carrying capacity of pasture, rate of forest growth, land value, farm income related to type and size of farm, etc., to these soil (or land) types and to their characteristics, it is possible to study the effect of land characteristics on land use. Our understanding of the utility for agricultural or other use, of lands having given characteristics may be thus increased to the point where we are enabled to classify the land types according to their utility.

While classifications of natural land types do not in themselves tell us what types of operating units are desirable nor how to rate properties according to productivity for equitable appraisal, they may provide important aids to these ends. In classifying farm properties for tax assessment according to productivity, in western North Dakota, it was found necessary first to rate the land types of which the properties were composed.

The Federal Bureau of Chemistry and Soils and also several states have undertaken to rate or classify soil types according to their productivity for various crops and pasture. 3/ Soil scientists in a few other states have rated soil types according to what is termed

3/ Edwards, M.J. and others. Soil Survey of Crawford County, Wisconsin, U.S.D.A. Soil Survey Reports, Series 1930 No. 34, pp.36-38

agricultural value, which in these cases appears to approximate pecuniary value as determined by utility for agriculture. 4/

The classification of natural land types according to productivity is not always a simple process, because the productivity of a given type differs according to the level or intensity of capital, labor and managerial inputs under which it is used. Therefore, except within areas in which the use of these other elements of production, that is to say, in which land-use practice, is fairly uniform, comparable measures of land productivity are hard to find. Most of the schemes for rating land types according to productivity or value involve giving weights to different characteristics of the land type such as depth and water holding capacity of the soil, nitrogen content of soil, surface configuration, etc., that are known to influence the growth of agricultural plants.

Land types other than soil types may of course be classified in various ways which may indicate or imply something of their use capabilities. The Tennessee Valley Authority has recently delimited land types, the individual bodies of which are 200 acres or more in area, and has classified them according to their physical characteristics and to certain features of their present utilization. The United States Geological Survey, for the Great Plains Region north of Oklahoma and New Mexico, has delimited land types which are distinguished and described principally in terms of their use capabilities. Land types which appear to be suitable for grazing only are distinguished from those on which it appears to be possible to undertake crop farming. The latter are in turn divided into three subtypes according to their relative utility for crop farming.

Land Classification For Equitable Appraisal of Properties

A form of land classification generally having certain distinct requirements is that which is carried on so that tax assessment may be made in proportion to the productive capacity of the land, and which also may be directed toward obtaining equitable appraisal of value as a basis for credit extension or land purchase. Whereas, other types of classification do not necessarily require an accurate

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4/ Storie, R. Earl. An Index For Rating The Agricultural Value of Soils. Calif. Agr. Expt. Sta. Bul. 556, Sept. 1933.
Howe, F. B. Classification and Agricultural Value of New York Soils. Cornell University Agr. Expt. Sta. Bull. 619, Jan. 1935.
Veatch, J.O. Agricultural Land Classification and Land Types of Michigan. Mich. Agr. Expt. Sta. Spec. Bul. No. 231 Apr. 1933
Williams, C.B. and others, Agricultural Classification and Evaluation of North Carolina Soils. N.C. Agr. Expt. Sta.Bul.293,Feb.1934

and complete picture of the physical layout of each individual operating unit, classification for tax equalization does. The land classification carried on in several counties of western North Dakota [5] has, as its primary objective, the rating of farms according to their productive capacity, in the interest of tax equalization. The procedure involves: (1) mapping in much detail the soil, lay of the land, stoniness, drainage, or any other feature having significant bearing on the productivity of the land; (2) defining natural land types on the basis of these land characteristics, and rating each type according to its productivity for important uses, i.e., crops or grazing; (3) adjusting the ratings according to forest growth, if this influences the value of land in the locality; (4) modification of the ratings of the land type on each property according to their productivity as a part of that property, taking into consideration, of course, such factors as the accessibility of land bodies from the farmstead, their size and shape insofar as it affects their utility, distance from market, distance from water (in the case of grazing land), and so on; (5) assembly of the ratings for each property so as to produce a single or composite productivity rating for it. to which assessment of land should be related. Complications in procedure will of course result where land and buildings are not assessed separately.

In the appraisal of the value of properties as security for loans, considerations other than the productivity of the land must be dealt with. Such factors as the value of improvements, the managerial ability of the individual operator, and fixed charges already borne by the property will ordinarily influence the safety with which loans may be extended. Nevertheless, the relation between land productivity and property value is sufficiently clear to warrant the supposition that classification of the kind required for tax assessment equalization will have usefulness in the appraisal of property values. Murray and Meldrum [6] have undertaken to show the usefulness of evaluating the productivity of soil types in valuing land. The determination of relative productivity of land, as has been indicated, (p. 14) is not a simple matter, due to the fact that productivity differs according to the levels of inputs of the elements of production other than land.

Hammar [7] has suggested the importance of measuring certain land factors such as the nitrogen and available phosphorous content

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[5] Kellogg, Charles E. and Ableiter, J. Kenneth, A Method of Rural Land Classification. U.S.D.A. Tech. Bul. 469, 1935.

[6] Murray, W.G., and Meldrum, H.R. A Production Method of Valuing land. Iowa Agr. Expt. Sta. Bul. 326, March, 1935.

[7] Hammar, C.H. "Factors Affecting Farm Land Values in Missouri". Mo. Agr. Expt. Sta. Research Bul. 229, Sept., 1935.

of the soil, the degree of clay pan or hard pan development, and the topography, in grading land according to productivity. The relationship of these and other factors to land values and crop yield is so striking as to suggest their use as criteria of productivity and value. If quantitative expression is to be given such factors in a manner which will indicate the productivity of specific lands, the factors themselves must of course be related to specifically bounded bodies of land, that is to say, mapped. The determination of actual areas having given measures of these factors, amounts to the mapping of land types, the distinguishing characteristics of which are the factors in their different degrees of intensity. Such land types would certainly be more or less closely related to soil types, the degree of relationship depending on how generally soil types were distinguished by difference in the factors to be used in evaluating productivity.

Classification of land for equitable appraisal, if it is to do justice to itself in serving this objective, involves careful time-consuming procedure, and will of necessity proceed slowly.

Use-District Classification

A use-district is here defined as an area, to all parts of which some recommendation concerning the desirability of given types of operating units or some statement concerning the probable effect of operating the land in given types of units, is uniformly applied, and which is large enough to encompass one or more operating units of a size and type adapted to the land. The differentiation of land into use-districts on the basis of differences in the recommendation or statement concerning types of operating units, is here called use-district classification.

A use-district is not necessarily an area in which the uses of land or types of operating units are recommended. It may be an area in which merely those types of operating units inimical to the public welfare are indicated, or in which the consequences of operating the land in given types of units is anticipated. The size of operating units is considered to be a feature of the type. Operating units are considered to include farms, stock ranches, grazing districts, forests managed or operated as units, whether in public or private ownership, parks, wild life refuges, or properties of other types, either public or private, which are used, managed or operated as units.

Use-districts classification in one form or another can effectively be used to serve the first eight objectives previously listed, namely those centering around the local distribution of population. It may also serve, but not quite so fully, the objectives of guidance in land investment and extension of credit. Ordinarily, it will not

adequately serve the equitable appraisal of properties for tax assessment, but information obtained as a basis of land classification of the use-district type may be useful in undertaking classifaction of land for tax assessment and for other purposes.

Some forms of use-district classification have been termed "land use plans" or "land utilization plans". L. R. Schoenmann, for example, carried out a form of use-district classification in Alger County, Michigan, based on information from the Michigan Land Economic Survey, designating it "A Land Utilization Plan".

Every statement or recommendation of use made as a part of land-use planning procedure must necessarily apply to some definite area. Local diversity in the character of land is so great and so general that most use plans which are made will have marked local differentiation. Specific plans will apply to specific local districts. Local land-use planning thus requires local differentiation or classification of areas, or districts.

The use-district type of classification, because of its important bearing on the distribution of population and related services and institutions, and because of its breadth of usefulness in the planning of major land uses, should be widely undertaken in sections having problems of choice in major land use and land settlement. This does not signify that it is urgently desirable in all regions having land utilization problems. Many problems of land utilization, as for example some of those concerned with land tenure, cannot be met by means of land classification.

The variation in form which use-district classification may take to meet different situations is almost infinite. A simple form consists of differentiating the areas in which agriculture is undesirable, from those in which it is not. This is essentially the form used in establishing the use district or zones in the zoned counties of northern Wisconsin. In some of the zoned counties three classes of districts were established, namely, forestry, recreation and unrestricted use-districts.

The land classification carried on in New York by the Cornell University Agricultural Experiment Station 8/ includes use-district classification, because in addition to classifying land according to the intensity of use to which it has been suited, the districts better adapted to forestry and recreation than to agriculture are indicated.

A more elaborate form of use-district classification is that in which not only types of major use but types of farming are recommended. County land-use planning studies in Montana have led to the

8/ Lewis, A.B. An Economic Study of Land Utilization in Tompkins County, New York. Cornell Univ. Agr. Expt. Sta. Bul. 590, 1933.

marking out, in each county, of use-districts, for each of which economically desirable types of farming are indicated. Land classification undertaken in several counties in the Sierra Nevada foothills establishes use-districts, and sets forth economic land uses for each district.

Use-district classification need not in every case indicate a single most desirable use for a district, but instead may indicate various alternative or complementary economic uses. It may simply state the limits of economic use by indicating what types of use are undesirable. In all cases where definite proposals or recommendations are made concerning a district, the justification for, and the evidence supporting the proposals, should be an integral part of any document presenting the classification. In cases where no recommendations are made, the desirability of uses may be implied by statements concerning the probable results of alternative patterns of operating units.

The recommendations or statements concerning a use-district may be qualified so as to introduce the factor of time. A statement that a district now consisting of largely uncleared, wild, land is fitted for farms of certain types, will not necessarily imply that immediate clearing and settlement of the district should be undertaken. More likely it will indicate merely that if and when there is a demand for new farms in the region or area, this particular district is one in which there appears to be to some opportunity for the development of successful farm units. The desirability of other changes in use may similarly be contingent upon circumstances. In those sections where excessive sub-division is practiced to create properties to be advertised and sold for agricultural purposes, specification of the minimum size of economic units should be a feature of land classification. Land classification embodying this feature apparently has not been undertaken to date.

The categories employed in three different use-district classifications already undertaken will illustrate the variety in form which use-district classification may take.

1. In Langlade County, Wisconsin, a use-district classification for rural zoning establishes the following kinds of districts. [9]

1. Forestry
2. Recreation
3. Unrestricted

2. In Eldorado County, California, a classification by Dr. Weeks and others delimits the following use-districts: [10]

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[9] University of Wisconsin, Langlade County: A Survey of its Natural Resources and Their Utilization. Extension Service of the College of Agriculture 1934. Spec. Circular.

[10] Weeks, David, Wieslander, A.E. and Hill, C.L. The Utilization of Eldorado County Land. Cal. Agr. Expt. Sta. Bul. 572, 1934.

I. Fruit Production with forest crop and industry.

II. Potential farm and/or forest crop.

III.A Medium and large scale livestock production.

III.B Diversified livestock farming and potential forest crop.

IV. Forest crop with recreation and grazing.

V. Recreation with forest crop land grazing.

(In this case the recommended dominant use is given first, but it may be dependent upon the secondary uses to make it feasible.)

3. For Alger County, Michigan, L. R. Schoenmann, using material gathered by the Michigan Land Economic Survey, has prepared a land-use-district classification [11/] in which the districts are assigned to those of the following categories of use which appear to be in closest harmony with the dominant character of the districts:

Forests:

- Experimental
- National
- State
- Private

Wildlife Propagation

- Sanctuaries and Refuges
- Public Hunting Ground
- Fur Farms
- Game Farms

Recreation

- Commercial resorts
- Hunting and Fishing Clubs
- Cottages and Camps
- Golf Courses

Parks

- State
- County
- Township
- City

Agriculture:

- Experimental
- Grazing type
- Dairy-woodlot type
- Dairy-hay-potato type
- Dairy-poultry-fruit type
- Garden-homes type

Cities and Towns

- Industries
- Business and residence
- Health homes
- Airports

Water Power Flowage rights and Plant Sites

The form which a use-district classification should take in

11/ Schoenmann, L.R. Land Inventory for Rural Planning in Alger County, Michigan. Papers of the Michigan Academy of Sciences, Arts and Letters, Vol. XVI, 1932.

any given case will depend both upon the objectives which the classification is expected to serve, and the availability of information on which to base the classification. Obviously no standard procedure can be set up which will meet all the situations which will occur in different parts of the country. Nevertheless, certain elements of procedure may be standardized, and some uniformity in practice may be adhered to in order to systematize the work throughout the country as much as possible, thus increasing its comparability and the facility with which it may be understood. Its usefulness toward achieving consistency in carrying out policies, and to some degree its usefulness in the determination of policy, may also be increased thereby.

CRITERIA AND CONSIDERATION WHICH MAY BE SIGNIFICANT IN LAND CLASSIFICATION

(With particular reference to use-district classification)

In choosing the items of information to be collected as a basis for, and in support of land classification, careful appraisal of the significance of each item, considering the form and objectives of the classification, should determine whether its collection is justified. There will be no situation in which every one of the items of information herein listed will need to be obtained. Most attention should be given to those items which, in the area to be classified, and in meeting the requirements of the form of classification decided upon, are most critical in their influence on the choice of land use. Availability and cost of irrigation water may be of paramount importance in the determination of use-districts in regions where crops must be irrigated, but may be unimportant elsewhere. In areas where the utility of the land for fruit growing is a point to be covered by the land classification, careful investigation of local thermal conditions will very likely be called for. In areas in which the desirability of fruit growing is unlikely to be an issue, local temperature studies will ordinarily not be necessary. In areas where arable farming is precluded, and in which the choice is between forestry, recreation, or grazing, or between different combinations or degrees of intensity of these uses, a soil map may not in every case be justified, whereas in areas where the choice of districts for arable farming is involved, a soil map will generally be desirable. The slavish collecting of all the items of information listed herein, should not, as is shown by these illustrations, be undertaken. Neither should a particular line of investigation be followed merely because it has been included in some land classification project elsewhere. Most land classification projects have been set up to meet a particular situation, and their details are therefore not generally suited for use in a widely different situation or for meeting different objectives.

On the other hand, it will not be desirable to undertake to establish use-districts with too small a body of supporting data.

The greater the body of supporting evidence, the more useful and defensible the land classification will be. Characterizations of areas on the basis of too broadly generalized information, or of insufficiently precise mapping of land may tend to defeat the purpose for which a classification is being made. Particularly in regions where land selling agencies are active, ill-founded, or ill-defined characterizations of districts may be used to support unwarranted claims concerning the value or utility of the land.

The finer the distinctions made between the types of use considered, the more precise and the more extensive will be the body of supporting data needed.

In long settled regions, the longer record of experience in the use of land provides a source of information not so abundant in newly settled regions where more complete reliance must be placed upon a study of the physical characteristics of land, and upon a determination of its use capabilities by inductive reasoning.

Following is a list of materials or items of information, which may have an important bearing on the establishment of use-districts. As already stated, the significance attached to these items will differ greatly according to the objectives of the classification, the region or locality, and in the case of some items, according to the political division. The usefulness of most items in a given area should be studied and weighed against the cost and the time required to obtain them.

Base Map

Since land classification must deal with specific places and areas, it must be presented on maps. A base map, of such scale and accuracy as will show clearly the land classes or use-districts into which every property in the area falls, is requisite. The scale of maps on which data is assembled should rarely be less than 1 inch = 1 mile. This is a convenient scale where it is adequate, inasmuch as most of the topographic maps of the U. S. Geological Survey and the Soil Survey maps have used it. In many places base maps on a scale of one inch to the mile will not be large enough to show the more intricately distributed items which must be mapped. In such cases scales of 2 in. = 1 mile, or 4 in. = 1 mile are recommended. It is recommended that all data obtained in connection with use-district land classification projects be assembled on base maps on one of these three scales: 1 in. = 1 mi. 2 in. = 1 mi. or 4 in. = 1 mi. It is further recommended that as far as possible all maps prepared for distribution be printed on a uniform scale, preferably on a scale of 1 in. = 1 mi., or in areas of extensive land uses, on a scale of $\frac{1}{2}$ in. = 1 mi.

The topographic sheets of the Geological Survey, if they are on a scale of 1 inch to 1 mile or larger, provide the most accurate and reliable base maps generally to be had. They may be photographically enlarged, if necessary. These maps show roads, railroads, houses, lakes, streams, swamps, contours, and all other important cultural and natural features. If the maps were not recently made, there will doubtless have been some changes in the pattern of roads and buildings, since they were issued. Planimetric maps without contours published by the Geological Survey are available for some areas. The soil maps published by the Soil Survey of the United States Department of Agriculture, on a scale of 1 in. = 1 mi. provide reliable base maps which may be used where adequate topographic maps are not available. Like the topographic maps, the soil maps show the important natural and cultural features. Many soil maps are printed on the topographic maps. Soil maps issued prior to 1910 do not provide as reliable base maps as those issued more recently.

Properly controlled aerial photographs provide an extremely valuable base for mapping present land-use, forest and other vegetation types, condition of erosion, soil type, property lines and many other important cultural and natural features. Aerial photographs may be obtained for many sections of the country.

In areas where accurate base maps are needed and are not available, it will be necessary to provide them either through aerial photography or plane-table traverse. In general, elaborate plane-table traverse should not be undertaken unless in connection with the mapping of soil types. If a project does not justify the mapping of soil types, it ordinarily does not justify the construction of an accurate base map by time-consuming methods. Soil surveyors of the Federal Bureau of Chemistry and Soils are skilled in combining the operations required in making base and soil maps.

Township plats, obtained from the General Land Office, may be used for some purposes in areas having the rectangular land-survey net. These of course do not show cultural features and show only a few natural features. Standard township diagrams may be used in plotting the location of properties, and in plotting data pertaining to properties, obtained from County records.

Soil Map

The modern detailed soil map does much more than tell something about the soils of an area. It locates definitely each body of land having a given set of physical characteristics, and tells what those characteristics are. Thus it shows each body of smooth, productive, well drained land, each imperfectly or poorly drained area, each area having impervious subsoil or "hardpan", each patch of stony land, and each body of steep hilly land. Thus the soil map, establishing in large measure as it does, the natural land types, gives a more

complete picture of the physical layout of an area than can be obtained by any other commonly used device. When used in conjunction with data indicating the use capabilities of the different types, it contributes much to the understanding of the use potentialities of a district. A soil map, to be of greatest usefulness in use-district classification, should show degree of stoniness and lay-of-the-land somewhat more fully than has been shown on most of the standard county soil maps.

The soil map, by establishing and mapping soil types, makes it possible to use the experience of people with a given type of soil in one spot, in judging what similar types of soil in other spots are capable of.

In use-district classification, the soil map is particularly necessary in newly occupied or unoccupied areas, where experience has not had time to demonstrate the use capabilities of every parcel of land, and also in areas where types of farming or farm enterprises are likely to be recommended in the classification. It is less necessary in areas of very extensive land use, such as the western range country.

Knowledge of the relationship of soil characteristics to plant growth safely permits assertions concerning the undesirability for certain uses of soils with certain characteristics. There are instances in which soil characteristics are so transcendent in causing certain uses of land to be undesirable, that recommendations against the introduction of some uses of lands having certain soil characteristics may be safely made without recourse to such consideration as locational advantage, or economic outlook.

Climatic Data

While the climatic characteristics of an area are influential in determining the kind of crops and type of farming, it is only in certain cases that climate accounts for local differences in the type of use. In areas characterized by marked differences in thermal conditions, due to elevation, exposure, air drainage, and distance from water bodies, local differences in use capabilities due to climate may be pronounced. This is particularly the case where the adaptability of the land to fruit is a point in question. In areas of this sort a study of thermal characteristics, both from existing climatic records and from biologic and other evidence, may be called for.

In determining the dry margin of economic grain production, a study of the precipitation history of local weather stations will be instructive. Much misunderstanding of the true climatic character of the Great Plains Region is due to failure to take account of climatic fluctuations and tendencies. Although people erred in their judgment concerning the use capabilities of certain areas in

the Great Plains, as a result of a few years of what later proved to be extraordinarily abundant rainfall, some of us seem just as likely to be misled by a year or two of drought and dust storms.

Lay-of-the-land

Mapping of the slope or surface configuration of the land may be useful in some sections where this factor is critical in determining economic uses. Logically, however, this factor should be mapped in connection with soil types, since these, as they are mapped in a modern soil survey, express in considerable measure in themselves, the slope and lay-of-the-land. To illustrate: A soil type occupying nearly level situations is not also found on steep slopes. Soil types occupying gently rolling or undulating situations do not ordinarily occur in strongly rolling or hilly country.

In general, if mapping of soil types is not justified, neither is mapping of lay-of-the-land. Of the two, the soil map is more useful, particularly as it in itself tells much about the lay-of-the-land.

Erosion Characteristics

Mapping of erosion characteristics should be undertaken primarily as a means of indicating the erodability of different land types under different kinds of use. The erodability of a soil type or land type probably has more bearing on the use to which the land is adapted, than the degree to which it has been eroded at a given moment. It follows that mapping of erosion characteristics should be undertaken in conjunction with the mapping of soil types, and in places where the erodability of the different soil types and slopes under various uses needs demonstration. The extent to which erosion has taken place may be indicated by the mapping of shallow or eroded phases of soil types.

Availability and Cost of Water

In irrigated areas the availability and cost of water is a primary factor to be considered in undertaking land classification. The establishment of use districts in irrigated areas will depend upon careful determination of present and probable future cost of water supply. Estimation of development costs on proposed irrigation projects or extensions is an involved and technical process, but is wholly justified in view of the activity in promoting irrigation developments and in the sale of irrigated farm lands which is so

prominent in some sections of the country.

In grazing country, the availability of watering places influences the type of grazing use. Location of power and reservoir sites will doubtless have importance in making use designations in some cases. The importance of water in determing recreational use is dealt with under "survey of recreational resources."

Drainage Costs

The economic feasibility of works to provide drainage and flood control will in some places have an important bearing on the establishment of use-districts. As in the case of irrigation, determination of the justification of drainage is a technical problem involving the service of engineers and economists.

Cost of Land Clearing

In forested regions the cost of clearing land of trees or stumps may be critical in determining whether types of operating units requiring land clearing are desirable. The determination of the effect of land clearing costs on the type of land-use may not be a simple matter. Arbitrary assignment of labor costs to the clearing process may often obscure the real importance of clearing costs since some clearing may be accomplished by family labor in periods when it would not otherwise be used.

Land Productivity Ratings

Soil maps may be made more useful if the various types shown on them are evaluated in some manner according to their use capabilities. (See "Classification of Natural Land Types").

Average Crop Yields

Records of average crop yields are helpful in determining the productive capacity of land types. They provide important evidence to support the delimitation of use-districts and the statements as to their use. Crop-yield data should consist of the average yield per acre seeded, over a period of several years. Crop-yield data pertaining to soil types or land types must generally be obtained by interview with farm operators. If data on farm business and farm practices are to be obtained by schedule, crop-yield information may be obtained at the same time. Because of the probability

of errors in reporting due to faulty memory, and because of the great variability in yield due to differences in management, a large sample must be used, if the data are to be very significant. In poor districts records of crop yields are not apt to be representative of the productive capacity of the land, because in such districts the crops tend to be grown on the superior, smoother, and more productive patches of land, while the less productive land, which probably determines the major use of the district, is very likely to be in woods or pasture. The intensity of use is therefore as significant a guide to use capabilities as crop yields, particularly in long settled regions, where the experience of people in using the land is reflected in the type of use. Intensity of use may be determined by mapping present use of land or by a study of land-use practices, or both.

Carrying Capacity and Seasonal Use Capability of Land for Pasture

[illegible] carrying capacity and seasonal use capability of pasture may be important considerations, particularly where there is question as to the competitive position of pasture and forest for land, and also in range country where the type of grazing land unit will be a feature of use-district classification.

Forest Site Quality

Determination of site quality and yield for different forest types and stands may be instructive in certain cases in which the type of forest use, or the desirability of using land for forestry or some other use is in question.

Survey of Recreational Resources

In many sections the presence of attractive recreational sites will exert an important influence on the delimitation of use districts. In sections where there are rural lands or waters thought to be desirable for recreational use, information bearing on their recreational usefulness should be gathered. This applies particularly to lakes and rivers, and to the land near them. The character of the shore, of the water, of the aquatic vegetation, and of bordering land vegetation should be ascertained. The extent of the present use of recreational sites may be determined by such criteria as the number of cottages and hotels, number of visitors, investment in recreational facilities, etc.

Present Use of Land; Vegetation Type

In all long settled regions, the present use of the land provides some indication of the type and intensity of use to which the land is adapted. The presence of many idle and abandoned fields and much forest or brush in such a region testifies to the experience of people in using the land for farming, as does also the dominance of improved land and tilled fields in an area. The prevalence of forest in a region which has been available for settlement for two hundred years is fairly reliable evidence that much of the land has been undesirable for agriculture.

Mapping in place the present use of land is a time-consuming process. The simplest way to get an accurate picture of land-use is by aerial photography. If aerial photographs of an area are available, it is a relatively simple matter to go over the ground and identify the various fields shown on them as crop land, pasture, idle land or woods. The number of use distinctions to be mapped will depend largely upon how detailed the study of the desirability of uses is to be. It is not invariably necessary to map individual crops or fields for a use-district classification, although there will doubtless be instances where such detailed mapping will be desirable. A good set of aerial photographs recently taken, tell much about the use of the land, even without additional field identification of uses.

Maps showing the present use of land are often helpful in locating and refining the position of use-district boundaries, since the use of land reflects to some degree its use capabilities. In New York a scheme of use mapping has been used in which the area is divided into ten-acre squares on the map, and the dominant crop or use on each ten-acre square is obtained by field investigation. This gives a fairly close approximation of the actual pattern of land use. A fairly good picture of the land-use pattern has been obtained in parts of the Great Plains wheat region from maps of farms showing crop land, idle lands and pasture, contained in AAA wheat contract records.

Mapping of native vegetation types will be of greatest usefulness in regions where the utilization of land depends on the utilization of the native, uncultivated vegetation, as for example, in the western range country, and in forested regions. In addition to type, it will sometimes be desirable to map condition and character of stands, as these have an important relation to the character of use. Mapping of native vegetation types, if undertaken in the same area in which present use of land is to be mapped, should be undertaken as a part of the same operation.

Study of Present Land-Use Practices

The mapping of the present use of land provides some evidence of current land-use practices, but more may need to be obtained from

proprietors by interview.

In the case of farm operators, information on management practices should be obtained from the same farms and at the same time as data on farm income and business, so that they may be related. Data on tillage, rotation, and fertilization practices, and on use of pastures and woodlands, will ordinarily be taken.

Indices of Returns from Farming

Important evidence as to the desirability of particular types of farming, or as to whether farming is desirable or not in a given district can be obtained from data on income received by operators of farms of various types and sizes, as well as from data on various conditions which reflect farm income. It must be recognized, however, that this sort of evidence is of limited usefulness in suggesting the desirability of alternative types of operating units which are not now represented in the area.

1. Farm income and business records. Records of farm business which provide one or more indices of the returns from farming or from specific farm enterprises, obtained by schedule from farm operators, or indices derived from such records, can be of important service in making a use-district classification in some situations. Items which may be obtained in this fashion include gross value of product, farm income, return to the operator for his labor, labor returns per farm worker, capital invested, and various others. A variety of data, not only on farm business, but on the economic and social status of farm families can be obtained by interview and placed on schedules. The advantage of taking a very elaborate and complete schedule should be weighed against the greater expenditure of time as compared with a simpler schedule. In general, it seems wise to limit the items to those of outstanding importance, and get data from a larger sample than would otherwise be possible. In all cases the size and type of the farm, and the income from non-farm employment should be obtained, as these, when related to total income and character of land can furnish important evidence as to the character and size of operating unit adapted to the district. In areas where the number of farms in each type of situation or in each probable use-district is large, records taken from a representative sample may be adequate. In other areas records from all farms may be desirable. Obviously each farm from which a record is taken should be located on the map, preferably so as to show its boundaries. (In States having a rectangular land survey, properties are easily located by their legal description in terms of section, township and range).

2. Land Values. Returns from the use of land are commonly reflected in land values. A study of prices received for properties at voluntary sales, using land transfer records available at the

county offices, may serve to give data on comparative land values. In most sections, however, transfers are not sufficiently numerous at any one time to provide a good comparison of local differences in land value.

In those parts of the country having the rectangular land-survey net, assessed value of land may be easily plotted on township plats. While assessments of land for taxation are seldom very systematically made, and although assessed value very commonly does not indicate probable sale value, the mapping of assessed valuation may, in some sections, give a fair idea of the relative value of land for agriculture, provided, of course, that the properties are farms, and that their value is not too dependent on stands of timber, mineral rights, or other non-agricultural influences. In general, assessed valuation may be expected to have rather limited usefulness in undertaking the establishment of use-districts. Declining property values may be in some instances indicative of a realization of the undesirability of present uses.

3. Size and Condition of Buildings, Fences and Other Equipment; Occupancy of Buildings. The value of farm buildings and other equipment is frequently indicative of returns from farming. Maps on which farms are classified according to the size and condition of buildings, and the condition of fences, fields and equipment, can be made fairly rapidly from the roads, by inspection. The practice generally consists of classifying the farms as excellent, good, fair, and poor, or in following a numerical grading scheme. To demonstrate the reliability of the size and condition of buildings, etc., as an index of returns from farming, business records may be taken from a large sample of farms, graded according to their appearance, and one or more of the various measures of income correlated with the grade of farm. 12/ Although this may seem like attempting to prove the obvious, it is often helpful to increase the objectivity of data presented in support of a classification. Having established a relationship between income from farming, and appearance of farms, the latter may be used in tentative or preliminary differentiation of the parts of an area, according to the remunerativeness of farming.

The presence of numbers of unoccupied or abandoned farm houses is usually evidence of financial failure in farming. The location of abandoned farmhouses, ruins of houses, and cellar holes marking the site of former houses, should be made a part of the classification of farmsteads according to appearance. An occasional unoccupied house may be of no significance as an indication of farm failure, but many such houses in the same district are usually indicative of it.

4. Tax Delinquency. Chronic tax delinquency of farm property is in some places indicative of financial failure. The significance of tax delinquency will vary according to the fiscal policy of the taxing jurisdiction. Lenience in providing penalties for tardiness in paying assessments may result in tax delinquency occurring more

12/ Lewis, A.B. "Method Used in an Economic Study of Land Utilization in Tompkins County, New York, and other Similar Studies in New York". Cornell University Agr. Expt. Sta. Memoir 100 April 1934.

or less irrespective of the ability of the owner to pay. A moderate amount of investigation will generally indicate whether chronic tax delinquency is occurring in an area, and whether it is due primarily to the policy of tax officials or to some other cause. In general, unless assessments have remained unpaid for two or more years on at least one-tenth of the acreage in an area, tax delinquency is not of sufficient importance to warrant careful recording. If it is present in considerable volume, however, it should be recorded and mapped. In States where property is described by section, township and range, it may be accurately plotted. Elsewhere the location of tax delinquent properties can be made only approximately. Properties which have reverted to the State or county through tax delinquency should be distinguished. Delinquent properties should be classified according to the length of the period of delinquency.

In some sections tax delinquency is most prevalent on cut-over forest land. Its presence on such land often tells little about the use capabilities of the land, but it may indicate an undesirable forest taxation policy, and that the owners have cut the timber and do not intend to hold their properties for further forest production. It will also indicate in some places, tracts which are likely to become public property. In this event, there is an additional reason for locating chronically tax delinquent property in that decisions concerning the desirability of uses will be influenced by the presence of publicly owned properties.

If the volume of chromic tax delinquency is large, and its amount and location are readily obtainable, it should be studied in connection with the support of local governments and their services, even though it may not aid in the delineation of use-districts. Data on tax delinquency may be particularly important in a study of the waste of public funds arising from land utilization practices.

5. Mortgage Foreclosure. Volume of farm mortgage foreclosures is not generally a reliable indication of the productive capacity of the land or of its use capabilities. Volume of foreclosures is greatest in some of our most productive farming sections. This is due in large measure to the smaller amount of credit extended in many of the less productive sections. Data on the ratio of foreclosures to mortgages held may provide useful evidence in support of use-district classification in some places. A study by Mereness (referred to on p.) showed that in southeastern Alabama, rate of foreclosures was related to the character of the land.

6. Extent of Relief. The extent to which farm families require continued relief from either public or private sources, provides important evidence as to whether an adequate living is being made from the use of the land. In considering whether a use-district should be closed to settlement, the ability of present residents to support themselves must be considered. County relief administrators

can generally supply data on the distribution of relief. As in the case of abandoned farms, and occasional instance is not particularly significant.

Effects of Present and Projected Use-Patterns On the Use of Public Funds

More convincing to local residents than any other type of evidence in support of recommendations than in certain districts further agricultural settlement be discouraged, or that the pattern of land occupancy be modified, is the waste of public funds resulting from certain types of occupancy.

Waste of public funds may occur through excessively high per capita expenditures for roads and schools required by areas of sparse and isolated settlement, which owe their sparsity of settlement to scarcity of productive farm land. While expenditures for public services, for the benefit of certain districts, in excess of revenues collected from the districts, may be justified on the principle of equalization of general welfare services, extraordinarily high per capita rates of expenditure, which are due primarily to the type of land occupancy and use, may be properly considered wasteful of public funds.

In many instances, the types of land use may not merely increase the cost of public facilities greatly, but may also fail to provide a living to the occupants of the land, causing them to depend on public subsidy to complete their livelihood. Such subsidy may take the form of direct relief, as, for example, chronic drought relief, of feed or seed loans not repaid, or of payment for services performed largely for one's own benefit. In some instances payment to residents for work on roads useful mainly to themselves, and for transporting their own children to school provides an inducement toward the occupancy of land in a manner wasteful of public funds. In addition it is frequently the case that many occupants of poor, sparsely settled districts contribute little or nothing toward the support of the services they receive, by failing to pay taxes levied on their properties.

There are, however, some thinly settled districts, requiring services at high per capita cost, of such character that further settlement may be encouraged. The distinction between thinly settled areas worthy of closer settlement, and those in which further settlement should be discouraged, will turn on the productive character of the land.

Measures of the extent to which public funds appear to be wasted on account of existing types of land-use will in some degree be indicative of the desirability of existing types of operating units.

The effect on public revenues and expenditures of possible alternative uses should be quite generally considered in applying recommendation or statements to use districts.

Achievement of desirable types of use and of operating units will be contingent upon local fiscal policies which favor, rather than obstruct the attainment of the desired use-patterns. The annual property tax, for example, is said to discriminate against deferred-yield uses of land, such as forestry, as compared with annual-yield uses, such as stock-ranching or crop farming. The returns from land in forest use, to private operators may, therefore, be greater or less than some alternative use, depending on whether the annual property tax, or some other tax procedure is followed.

In considering the influence of different types of operating units on the general welfare, some consideration of the effect of existing fiscal procedure on the desirability of different land-uses appears to be necessary. Statements concerning the desirability of operating units and land-use patterns should make clear, however, what advantages are to be had from maintaining or introducing types of use which depend for their advantage on specified modification in fiscal policy; that is to say, statements of use-capabilities should not be based on an assumption that present fiscal procedure is to remain fixed. The results under alternatives of fiscal procedure should, rather, be indicated.

Community Pattern

Decision as to location of use-districts, as well as the means of bringing about the desired uses in each will be influenced by the distribution of population, the size and location of properties, and the location of villages, roads, schools, railroads, power lines, factories, mines, resorts, etc.

1, Distribution and Characteristics of Rural Population, Roads, Schools, Stores, Mines, Factories, Power Lines, etc. A fairly precise picture of population and the various facilities serving it will be necessary in making most types of use-district classification, not only because of the bearing it may have on the delimitation of the districts, but because of its relation to social adjustments which may be involved in measures to bring about the desired uses. Population needs to be studied by characteristics and composition, including the characteristics of family groups, and by occupational status, and the total number as well as the numbers in different age groups should be located on maps by dots close to the point of residence. Schools and school district boundaries need to be mapped and the attendance at each school noted. Roads need to be classified as to type, or quality. Mines and factories should be studied as to the number and point of residence of workers, and as to the probable

future volume of employment which they will provide.

2. Ownership Pattern; Intent in Ownership; Distribution of Land in Farms. The location, size and type of properties, as well as the type of ownership and intent in ownership will have an important bearing on the means of attaining land-use adjustments, if not on the recommendations of use. In those States or parts of States possessing the rectangular land-survey net of the General Land Office, the location of individual properties on township plats is a relatively simple task, inasmuch as each property or parcel is described on the assessor's or other county records according to the section, township and range in which it is located. Where the rectangular land survey is not present, plotting of properties is difficult and time-consuming, and probably should be undertaken only where the nature of the problem makes it especially necessary. Plotting of each property serves to show the distribution of holdings of different sizes. In addition to size, data on the type of property -- farm, forest, or other type, -- is important in gauging the effect of proposals as to the use of districts, and also in helping to define the districts and determine their economic uses.

In some States farm property may be distinguished on the assessor's roll from other property only because it is listed as having improvements. In some places it may not be possible to identify the type of property from the assessor's roll, in which case inquiry among assessors or other county officials will usually serve to identify it.

Wherever possible, the intent of owners in holding their property should be ascertained and mapped, as this may have an important influence on effecting land-use adjustment.

All land in farms in the area should be definitely located on the map and distinguished from other land, where property is described in terms of the rectangular land net. Elsewhere, because of the labor involved in locating farm boundaries, the approximate location of farm land, obtained by reference to the location of farmsteads, will generally have to serve. Operated farms should be distinguished from abandoned farms in case the latter are still identified as farms. A moderate amount of interviewing and inspection will permit the classification, by type, of farms located.

With each farm located on the map, the character of its land may be determined by placing the map of farm boundaries on a soil map or maps depicting other land characteristics. The location, size, type, and land character of each farm having been ascertained, any other data such as that on income, value, part-time employment, or extent of relief, may be related to these factors. In addition to classification by type of property or intent in ownership, property may be classified by type of owner, as for example, individual, insurance company, bank, county, State, etc.; and by residence of owner, as for

example resident of county, or non-resident of county. Ownership of land by credit agencies as a result of foreclosure may thus be determined.

In general, properties in cities and villages, platted properties outside of cities and villages, and rural properties of less than three acres, should be omitted, as they are of little importance to the problem, and their omission will save them. Exceptions to this rule will occasionally need to be made, however, as in cases where small recreational properties, such as cottage sites, are important.

In determining the ownership pattern it will not ordinarily be necessary to examine deeds or otherwise to check or to correct the county ownership records, even though these may not be wholly up-to-date. Usually the fact that a few changes in ownership are not recorded in county ownership lists will not greatly reduce the value of the picture of the ownership pattern obtained from such lists.

Trends in Use

Historical trends in land-use may be among the most significant evidence of the desirability of particular uses. Gradually increasing capital on the part of farm proprietors, and gradual improvement of community services in a newly developed area, are generally indicative of agricultural desirability. On the other hand, gradual loss of capital brought into an area, and contraction of the cultivated area, accompanied by deterioration of community service, usually support the conclusion that the types of use have been more intensive than the character of the district justified. Changes in acres of particular crops or numbers of livestock are likely to be in response to economic influences which point toward desirable or undesirable uses of the land.

Except for data from the Census by counties, it is usually difficult to get accurate quantitative information on trends in land use. Data by counties are insufficiently localized to indicate differences in trend between use-districts which will commonly occupy areas smaller than counties. In a few States some indication of trends may be obtained from assessor's records. Changes in community pattern may be gauged by differences in the location of houses, roads, etc., shown by maps made in different years or periods, or by interview with local residents. Abandonment of fields, farmsteads, roads, and schools are tangible evidence of trends, the progress of which can usually be determined from some of the older inhabitants of the locality.

Market Accessibility and Other Factors Of Location

The accessibility of a district, both with respect to areas

of consumption of its possible products, and to local trading centers, is a matter which will nearly always require some consideration in gauging the suitability of the district to different types of operating units. Some understanding of the cost, attributable to location, of marketing the products of a district, and of its relation to prices which may be received by producers, will be implicit in almost any statement concerning the desirability of use. The matter of accessibility to areas of consumption would, of course, be one phase in a study of comparative advantage. Advantages or disadvantages of residence aside from marketing cost, due to locational factors, will commonly require some consideration. Isolation from stores, physicians, churches, high schools, etc., often influences the decision of individuals in determining places of residence and types of operating units. The matter of local accessibility is, of course, closely related to the study of community pattern, and maps depicting the latter (discussion on p. 32) will be useful in indicating accessibility. Topography and drainage will need some consideration where they contribute special difficulties in transportation.

Economic Outlook, Comparative Advantage

Considerations of the probable demand for specific products of a given area, in relation to the supply, and other considerations influencing price, while they will not commonly determine the local differentiation of use-districts, will, in many instances, influence the character of the recommendation or statement of probability concerning the use of districts. Probable national demand for forest products and the advantage of a particular region in supplying that demand as compared with other forest regions, would, for example, affect the decision as to whether use-districts in the particular region are to be recommended for forestry under intensive management, or under management consisting merely of protection. Along the South Atlantic and Gulf Coasts are thousands of acres of forested sandy land, the characteristics of which, both as regards soil and climate, are not different from other lands in the same region profitably devoted to the production of intensively cultivated early-season vegetables which are marketed largely in Northern cities. Stated or implied recommendations that this forest land be cleared and devoted to truck crops in a given district should be made only after consideration of the likelihood of sustained or improved demand for such products, and after consideration of the advantages of the given districts as compared with present and potential competing areas.

It will not, of course, be expedient to undertake elaborate studies to anticipate general economic conditions or price situations in connection with land classification projects. Neither will it be desirable, in most cases, to undertake involved studies of the comparative advantage of competing areas in commodity production. Nevertheless, use should be made of whatever information there is available bearing on these considerations, and assumptions

as to economic outlook or regional or areal advantage should be within the bounds of reasonable expectation.

Appraising Importance of Considerations

There are innumerable other items of information or evidence which will, in some instances, have a bearing on the outlining of use-districts, and on the character and support of recommendations, or statements concerning their use. The preceding list is given, not with the intention of excluding other items, but to draw attention to the more generally required items, or items which have been frequently proposed or used in connection with land classification projects.

The importance of critically appraising the significance to the problem at hand, of the various items of data or lines of investigation which may be suggested, before expensive projects are undertaken, cannot be over-emphasized.

Considering the variety of situations in the United States in which use-district classification may be undertaken, it is not surprising that, except for the base map, some kind of which is everywhere necessary, there is no single item of information which is invariably required. Certain items, however, will be more commonly or generally needed than others. These are, aside from the base map:

1. Soil Map, with types mapped and described in enough detail to treat local differences in land character which are important enough to influence land use.

2. Community pattern, including location of farmsteads, roads, schools, school districts, stores, villages, power lines, mines, and factories; distribution of rural population by characteristics, and by sources of supporting employment, location of properties, location of land in farms, classified as to occupancy.

3. Present land-use practices, related to land character, to returns from farming, and to trends in land-use.

4. Indices of returns from farming collected so they may be related to other data concerning farms, such as size, and type.

5. Trends in land-use.

6. Effect of present and projected use-patterns on public finance.

PROCEDURE IN USE-DISTRICT CLASSIFICATION

In broadest outline the procedure involved in undertaking use-district land classification will consist of the following steps:

1. Consider the land utilization problems of the area in question.

2. Consider whether land classification of the use-district type will facilitate the measures necessary to meet the problems of the area.

3. In view of the measures which it is expected land classification will facilitate, what form and what features should the classification have?

4. What items of information are needed (1) as evidence in support of the classification, and (2) to facilitate the bringing about of land-use adjustments which the classification may propose.

5. Determine which of these items are available or may be obtained for the area in question.

6. Eliminate items whose cost of collection outweighs their usefulness.

7. Gather remaining significant data.

8. On basis of evidence gathered draw tentative use-district boundaries, and draw up tentative proposals or statements concerning the pattern of operating units.

9. Consider most carefully the probable effect of carrying out any proposals, or of having various alternative types of units, in terms of changes in community pattern, of changes in tax revenues and public expenditures, and of ability of the land to support population; and account for the livelihood of all families to be displaced as a result of proposed extensification of use. Weigh all the evidence tending to substantiate or controvert the desirability of the proposals. If the classification contains proposals for use which involve displacement of families, some qualification of the proposals will in many cases, be needed so as to introduce the element of time. Certain changes in major use of land, while they may be ultimately desirable, may not be expedient or desirable at the moment. Clarity on this point may save embarrassment.

10. Modify the districts and the statements concerning them where necessary, in the light of these considerations.

11. For each use-district, present the more important evidence in support of any proposals made, or in support of statements concerning the effect of alternative use-patterns.

12. Submit use plans tentatively arrived at, together with the supporting evidence, to local groups and to interested State agencies for their comments or suggestions.

13. Draw revised plans for the use-districts of the area, admitting, of course, that they are always subject to further revision.

The details of procedure can be properly worked out only after the selection of specific projects has been made, and the conditions of the project determined.

Boundaries of Use-Districts

Use-district boundaries should be drawn so as to provide for the inclusion of land of a kind and an amount required for entire operating units of a type adapted to the land. This does not mean that the land in the district must be uniform in character. An economic farm unit will, in many cases, contain not only smooth land for crops, but steep, or stony land for pasture or woodlot. A use-district drawn to include a group of such farms, present or potential, may therefore contain the steep, stony land, useful for pasture or forest products, along with the smooth land, useful for crops. In such instances, however, all important bodies of land unsuited to crops should be outlined and so designated on the use-district map. The use of steep or stony land may be complementary to the use of the smooth land in such a way as to make possible a more efficient use of the operators' labor and capital. This does not mean, on the other hand, that a use-district must contain land of diverse characteristics. If adjoining bodies of land with different characteristics are not likely to have complementary or supplementary use within proposed operating units, placing them in the same use-district will be questionable. Furthermore, it will not invariably be desirable to place land with complementary uses in the same use-district. Some districts, e.g. grazing districts, may be set aside for the collective use of nearby proprietors, while others, such as public forests, may be used collectively by nearby proprietors and others, including the general public.

In States having the rectangular land survey net, boundaries of use-districts should not cut across present property lines unless there is definite reason for their so doing. There will, of course, be instances in which use-district boundaries should divide present properties. In the absence of a reason for dividing them, however, whole properties should be placed in one district. Where properties are described in terms of the rectangular land net, property boundaries are easily located and mapped.

In States not having the rectangular land survey net, property lines cannot be so easily located, so that unless location of property lines is required to serve properly the objectives of the land classification, it will not generally be feasible to follow them in drawing use-district boundaries, in such States.

The general position of boundaries of use-districts may be determined either by natural features, such as soils and lay-of-the-land, or by cultural features such as location with respect to communities and route of travel.

Designations of Use-Districts

In general, it will be good practice, in designating use districts on the map, to avoid terms which might carry unintended implications. Ordinarily, the safer plan is to designate each type of district with some number or symbol which carries no implication of recommended use, and then give a full and specific characterization or statement concerning each type of district so designated. For example:

Map Designation of Districts	Statement
"Ac"	"Cash grain farms of less than 640 acres have not produced income adequate for family living in districts of this type because of the low and irregular yields due to frequently recurring years of low rainfall. Farms of 1000 acres or more which combine cash grain and livestock enterprises have been most successful in meeting the irregular moisture conditions which characterize the districts. Etc., etc." (Continue with further necessary characterization).
"Agd"	"Because of the broken surface of these districts they contain little land suitable for grain or forage production, and are hence limited in their utility to extensive grazing. Because of the location of these districts with respect to livestock feed bases, and because these districts can most effectively provide spring and fall range for nearly all ranches in the area, and because of the cost of fencing etc. required for their division into individual ownership tracts, they can probably best be used in common by nearby ranchmen as grazing districts. Etc., etc." (Continue with further necessary characterization).

The above treatment is merely illustrative of a form in which designations of use-districts on the map do not carry implications, but refer to full and specific characterizations of the districts in the discussion which should accompany the map. Being merely illustrative, the above form need not, of course, be followed as to detail.

There may, of course, be cases in which districts may be safely designated on the map by descriptive terms, but the practice should not be followed unless it is quite certain that the terms do not carry undesired implications.

In this connection it should be noted that many land use terms do not have a single, generally understood, meaning but have been loosely used. Take the commonly used word "agricultural" for example. When applied to land as a descriptive term, it may mean to one individual, "capable of being used for farming;" to another, "used for agriculture at present;" to another, "capable of being plowed and cropped."

The current wide use of the term "sub-marginal" is another illustration of how a term subject to precise definition may be loosely and ambiguously used and construed. It is therefore absolutely necessary, in describing or characterizing use districts, that all terms which are subject to interpretation in more than one way be given a strict and precisely worded definition so that readers may know what is really meant.

Size of Project

The unit of operations in a use-district land classification project will ordinarily be the county. In general it will be desirable to have the initial project in a region, area or situation cover not more than one county, so that the procedure may be developed, systematized, and standardized before a large area is undertaken. It will be found that a certain amount of trial and error will be necessary in developing a procedure which will be satisfactory in meeting the situation in a region.

WHERE IS USE-DISTRICT CLASSIFICATION CALLED FOR?

Consideration of the objectives which land classification may serve -- or stated in another way, the measures which it can facilitate -- gives a guide to the situations where it is likely to be most useful. It will be apparent that land classification will not be of equal benefit in all regions and all situations. In some situations land classification will appear to have fairly direct and immediate usefulness. In other places, including some of those beset with important land utilization problems, such as the eastern Kentucky mountains, the immediate usefulness of use-district land classification may be somewhat problematical. Classification for equitable appraisal would appear to have almost general usefulness, but because of its time-consuming requirements, there are practical limitations to its being widely undertaken. Some of the sections where use-district classification will be particularly useful are treated in the following paragraphs.

Sections Having Much Indiscriminate Land Settlement and Land Selling Activity

Land classification directed toward the guidance of private land settlement will be of most immediate value in those sections now experiencing a tendency toward indiscriminate land settlement -- that is, settlement without proper discrimination between lands of different capabilities. While not confined to any particular sections, the sale of alleged farm land to undiscriminating buyers is more generally to be noted in the agriculturally newer portions of the country, namely the West, the northern Lake States, and parts of the South, than in longer settled regions, since in these newer sections, an

understanding of the potentialities of all the land has been less well and less widely established through experience.

The Far West has long experienced a notable amount of indiscriminate land selling and land settlement activity. The tradition of going West to find land has been persistent, and has undoubtedly led to financial losses through land purchase, and to the occupancy of lands for farming farther below the margin of profitable cultivation than in almost any other section. The attractiveness of the region as a place of residence has led many people from other sections to undertake land purchase without much understanding of land capabilities. During and following the drought of 1934 in the northern Great Plains, numbers of people from the Plains migrated to the Pacific Northwest in search of homes. The latter section has a large acreage of cut-over forest land, of which the local differences in use capabilities are inadequately known. Sale of this land to prospective settlers is made with too little discrimination as to the character and use capabilities of the land. Land classification setting forth use capabilities can aid in preventing the recurrence, in this region, of the type of indiscriminate settlement which has caused so much grief in the northern Lake States, particularly if it is accompanied by measures for controlling land settlement and sale. Land classification to serve this objective is called for in such sections as western Oregon, and Washington.

In sub-tropical regions such as southern California, Florida and southern Texas, where the anticipation of operating a fruit or nut farm in a balmy climate has a romantic appeal, land-selling agencies have been particularly active. Many sales have been made to individuals poorly informed as to the utility of the units purchased, and as to their suitability for the purposes for which they were represented as being desirable. Units too small to provide a living through farming have been purchased by those unacquainted with the agriculture of the area, under the impression that a living could be made from them by farming. Small parcels of farm land in these sections are sold, not only as farms, to prospective operators, but also as investments, in many cases without much respect to their earning capacity. Land classification which will set forth not only the range of economic use of lands in sections of this sort, but will make some statement as to the minimum size of economic operation unit for adapted enterprises or types of farming, will help avoid misguided land purchase and land settlement.

The cut-over section of the northern Lake States has experienced a considerable volume of misguided land settlement. While this at present is less pronounced than in the past, delineation of the agriculturally more desirable lands is demanded, both in preparedness for future private land settlement activity, and in giving guidance to the relocation of scattered settlers now occupying poor land.

Scattered sections experiencing a tendency toward misdirected settlement may, of course, be found elsewhere.

Sections in Which Publicly Assisted Population Redistribution Has Been Proposed

Land classification in areas in which relocation of population is anticipated should serve the purpose not only of identifying the areas where retirement is desirable, but of discovering the areas in which resettlement may offer superior opportunities, and of determining what extensive use had best replace farming on the retired farm lands. Consideration will of course have to be given to factors outside the areas being classified, which may influence the desirability of population redistribution in given cases. Land Classification to serve these objectives is called for in proposed farm retirement areas.

Sections in Which Public Land Acquisition is Proposed for Specific Public Uses

Acquisition of land for public forests, wild life preserves, etc. should be preceded by land classification which systematically weighs the use alternatives, public and private, and determines as well as possible which will serve the greatest common good. In those sections in which reversion of land to public ownership through tax delinquency is taking place, it should be a function of land classification to determine which of these tax-reverted lands are to be retained by the public for specific public uses and which, if any, may justifiably be sold for private utilization.

Land classification in guidance of public acquisition is presumably called for in those areas where replacement of arable farming by other major uses has been proposed, and in which public acquisition for definite public use is anticipated.

In summary, use-district classification is needed, (1) where the desirable uses, although apparent to many, are misunderstood by others for whose benefit and guidance some official statement of the use capabilities of the land is needed; or (2) where the most desirable major use and community pattern is problematical and open to question.

COMBINATION OF USE DISTRICT CLASSIFICATION WITH OTHER TYPES OF LAND CLASSIFICATION

It will be feasible in some cases, or perhaps even desirable, to combine use-district classification with certain other types of land classification, such as the classification of natural land types. Land classification undertaken in New York to identify and delimit areas to be recommended for public purchase and reforestation under the Hewitt Acts combines a use-district classification, in which land classes suited to agriculture are distinguished from those better suited to forestry and recreation than to agriculture, with a classification of agricultural lands according to the intensity of their agricultural use.

The appraisal of the use capabilities of natural land types will be an important part of the procedure in many, if not most use-district classifications.

PUBLICATIONS

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1934. Langlade County, A Survey of its Natural Resources and Their Utilization. Extension Service of the College of Agriculture, Spec. Circular.

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1935. A Method of Rural Land Classification. U.S.D.A. Tech. Bull. 469.

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