LAND CLASSIFICATION
IN THE
UNITED STATES.

NATIONAL RESOURCES' PLANNING "BOARD LAND COMMITTEE 1941 .

LAND CLASSIFICATION IN THE UNITED STATES

MARCH 1941

NATIONAL RESOURCES PLANNING BOARD

LAND CLASSIFICATION IN THE UNITED STATES

REPORT OF THE

LAND COMMITTEE

TO THE

NATIONAL RESOURCES PLANNING BOARD

UNITED STATES GOVERNMENT PRINTING OFFICE

WASHINGTON: 1941

EXECUTIVE OFFICE OF THE PRESIDENT NATIONAL RESOURCES PLANNING BOARD WASHINGTON, D. C.

December 20, 1940.

THE PRESIDENT,

The White House.

MY DEAR MR. PRESIDENT:

We take pleasure in transmitting herewith the report on Rural Land Classification, prepared by the Land Classification Subcommittee of the Board's Land Committee. This report includes (1) a comprehensive exposition of the status, methods, and geographic coverage of land classification in the United States, (2) an interpretation made from this information, indicating the importance of certain characteristics common to all land-classification work; and (3) a list of general and specific recommendations directed to scientists, administrators, and land-planning technicians.

This report represents an important step in the development of land-planning techniques and thus a significant contribution to sound land-use planning. Dissemination of the findings of this report will, we believe, be of distinct value to all those who are concerned with problems of land utilization and land planning.

Respectfully submitted,

FREDERIC A. DELANO
Chairman
CHARLES E. MERRIAM
GEORGE F. YANTIS

NATIONAL RESOURCES PLANNING BOARD

FREDERIC A. DELANO

CHARLES E. MERRIAM

GEORGE F. YANTIS

ADVISORS

HENRY S. DENNISON

BEARDSLEY RUML

DIRECTOR

CHARLES W. ELIOT, 2d

ASSISTANT DIRECTORS

RALPH J. WATKINS

THOMAS C. BLAISDELL, Jr.

FRANK 'W. HERRING

EXECUTIVE OFFICER

HAROLD MERRILL

LAND COMMITTEE

WILLIAM I. MYERS, Chairman

WILLIAM I. WIYERS, Chairman

CARL L. ALSBERG

OSCAR L. CHAPMAN

CHARLES C. COLBY

PHILIP H. CORNICK M. S. EISENHOWER

CHARLES A. LORY

LEE MUCK

H. R. Tolley

GEORGE S. WEHRWEIN

M. L. WILSON

JOEL D. WOLFSOHN

GILBERT F. WHITE
Technical Secretary

SUBCOMMITTEE ON LAND CLASSIFICATION

CHARLES C. COLBY, Chairman

C. P. BARNES

J. F. DEEDS

G. DONALD HUDSON

A. B. Lewis, Consultant

K. C. McMurry, Consultant

LAND CLASSIFICATION IN THE UNITED STATES

CONTENTS

Part I

Page

Chapter

I.	Point of View and Scope of the Investigation	1
II.	Types of Land Classification	3
	Perspective	10
	Recommendations	23
	Part II	
v.	Tabular Statement of Land-Classification Activities in the United States	26
	Part III	
VI.	Aerial Photographs in Land Classification	35
VII.	Surveys of Public Lands by the General Land Office	39
VIII.	Geologic, Topographic, and Hydrographic Land Classification by the Geological	
	Survey	44
IX.	Nation-wide Forest Survey of the Forest Service	54
	Soil Survey of the Bureau of Plant Industry and State Agricultural Experiment	
	Stations	58
XI.	Conservation Surveys of the Soil Conservation Service	65
XII.	Land Classification in the Bureau of Reclamation	71
XIII.	Land Studies in the Office of Indian Affairs	80
XIV.	Scenic, Historic Sites and Recreational Land Classification of the National	
	Park Service	86
XV.	Range Survey Procedure	95
XVI.	Range Land Classification of the Grazing Service	. 99
XVII.	Land Classification Work in Michigan	103
CVIII.	Land Classification in the Tennessee Valley Authority	111
XIX.	Economic Land-Classification Studies in New York	125
XX.	Land Classification as a Part of Area Land Use Planning in Montana	133
XXI.	Land Classification in the Sierra Nevada Foothills of California	138
XXII.	Rural Land Classification for Tax Assessment	142
XIII.	Land Classification as a Part of the County Agricultural Land-Use Planning	
	Program	145

NATIONAL RESOURCES PLANNING BOARD

EXECUTIVE OFFICE OF THE PRESIDENT

NATIONAL RESOURCES PLANNING BOARD

WASHINGTON, D. C.

October 7, 1940

MR. FREDERIC A. DELANO, Chairman,
National Resources Planning Board,
Washington, D. C.

DEAR MR. DELANO:

The Land Committee submits herewith a report on Rural Land Classification in the United States. The inquiry on which the report is based was initiated in January of 1939. It emphasized a four-point question in regard to land-classification work, namely, what techniques are being employed, in what areas, for what purposes and with what results. In addition, the inquiry gave much attention to the form in which the results appear. Subsequently, the returns from this broad inquiry were tabulated and analyzed to bring out both their practical and scientific values.

The report is the first comprehensive exposition of the status, techniques, methods, and areal coverage of land classification in this country. It gives both chronological and areal perspective in this highly technical field. In addition, it points out for the first time the existence of five distinct types of land classification. The recognition of these types should do much to define and clarify the field of action of land classification, to bring about agreement in its terminology, and to broaden and intensify its usefulness in the solution of land-use problems and in the development of land-use programs.

In its exposition, the report points out the notable progress in land-classification techniques in recent years, and shows that the use of aerial photographs and mosaics as bases for recording field data has led to greater accuracy and speed in land-classification work.

The report deals with both general and specific considerations: pointing out gaps in our knowledge of land resources; indicating useful directions in which land-classification activities can be expanded; and evaluating the techniques by which and the channels through which land-use adjustment recommendations, implicit in certain classifications, can be carried out. Although the present report is confined to a discussion of rural land classification, the Land Committee recommends that a companion study of urban land classification be made.

The inquiry was made and the report prepared by a Subcommittee of four, with Charles C. Colby, a member of the Land Committee, as Chairman. Dr. C. P. Barnes, of the Department of Agriculture, and Mr. J. F. Deeds, of the Department of the Interior, were designated to represent the land-classification activities of their respective departments. The fourth member of the Subcommittee, Professor G. Donald Hudson, of Northwestern University and, until recently, Chief of the Land Planning Division of the Tennessee Valley Authority, cooperated with Professor Colby in planning the inquiry and in analyzing the tabulated results. The Subcommittee was fortunate in having as consultants, Professor K. C. McMurry, Chairman of the Department of Geography at the University of Michigan, and Dr. A. B. Lewis, Senior Agricultural Economist of the Farm Credit Administration. Throughout its deliberations, moreover, the Subcommittee enjoyed the interested and able cooperation of men from many Federal and State agencies and from other specialists in the field of land classification.

The Land Committee regards this report on land classification with enthusiasm both as an important step in the development and evaluation of land-planning techniques and as a vital part of sound land-use planning. We believe that its findings will be of value to technicians, administrators, and others in the broad field of land utilization and land planning.

Respectfully submitted,

THE LAND COMMITTEE

WILLIAM I. MYERS, Chairman

Head of Dept. of Agricultural Economics and Farm Management, Cornell University

CARL L. ALSBERG,
Director, Giannini Foundation
University of California.

OSCAR L. CHAPMAN,
Assistant Secretary
Department of the Interior.

CHARLES C. COLBY, Professor of Geography University of Chicago.

PHILIP H. CORNICK,
Institute of Public Administration.

MILTON S. EISENHOWER, Land Use Coordinator Department of Agriculture.

CHARLES A. LORY,
President Emeritus
Colorado State Agricultural College.

LEE MUCK,
Director of Forestry
Department of the Interior.

H. R. TOLLEY,

Chief of Bureau of Agricultural Economics
Department of Agriculture.

GEORGE S. WEHRWEIN, Professor of Economics College of Agriculture University of Wisconsin.

M. L. WILSON,
Director of Extension Service
Department of Agriculture.
JOEL D. WOLFSOHN,
Assistant to the Commissioner
General Land Office
Department of the Interior

VIII

INDEX

acquisition of public domain, 11	economic features
adjustment of land uses, 6	Michigan land resources, 103-
administration, Federal, State, 19	Montana land resources, 133
aerial photography	New York land resources, 125
conservation surveys, 67	reclamation projects, 72
geological surveys, 35	Sierra Nevada foothills area, 138
Indian land surveys, 83	tax assessment procedures, 142
mosaics, 35, 111-, 119-, 123	educational, demonstration programs, 8
soil surveys, 63	El Dorado County, California, 139
Agriculture, Department of	electric lines, mapping, New York, 129
activities, 26	Emmet County, Michigan, 106-
aerial photography, 38	erosion prevention surveys, 65
Agricultural Economics, Bureau of	exploitation vs. conservation, 16
activities, 26	exploitation vs. conservation, 10
agricultural land-use planning	form abandanment studies 195
county, 145	farm abandonment studies, 125
Indian lands, 82	farm-unit plat, reclamation projects, 73, 76
Michigan, 103-	Federal agencies
Montana, 133-	Department of Agriculture, 26, 38
New York, 125-	Bureau of Agricultural Engineering, 26
Tennessee Valley Authority, 30, 59, 111	Bureau of Plant Industry, 26, 58
agricultural regions of U. S., 11	Forest Service, 27, 54
area of public domain, 40	Soil Conservation Service, 27, 65
area or public domain, 10	Department of the Interior
Bureau of Plant Industry, 58	Bureau of Biological Survey, 28
Bureau of Reclamation, 71	Bureau of Reclamation, 28, 71
Burns-Homer-Pleasant Soil Conservation District, Winona	General Land Office, 28, 39
County, Michigan, 67	Geological Survey, 29, 44
County, Michigan, or	Grazing Service, 29, 99
	National Park Service, 28, 86
cadastral surveys	Office of Indian Affairs, 29, 80
origin, development, 10, 40	Resettlement Administration, 31
Office of Indian Affairs, 84	Tennessee Valley Authority, 30, 111
California	
Agriculture Experiment Station, 31	Fergus County, Montana
El Dorado County, 139	economic conditions, 136
Sierra Nevada foothills area, 138	income probability, 134
conservation surveys	land-use forecast, 132
origin, development, 16, 19, 39	soils and production, 135
Soil Conservation Service, 65	field methods, survey techniques
Continental Congress	Bureau of Plant Industry, 61
survey plan recommended (1785), 10	Bureau of Reclamation, 71
contour maps	California state agencies, 138
Geological Survey, U. S., 45, 49	County Agricultural Land-Use Planning Program, 145
Cornell University Agricultural Experiment Station, 32	Forest Service, 54
County agencies, activities, 34	General Land Office, 40
County Agricultural Land-Use Planning Program, 9, 145	Geological Survey, 47
crop yields related to soil types, 59	Grazing Service, 101
••	Michigan Land Economic Survey, 103
definitions	Montana state agencies, 133
efosion-slope-soil types, 66-	National Park Service, 88
geological surveys, 44	New York state agencies, 126
land classifications, 1	Office of Indian Affairs, 84
public domain, 44	Range Survey Procedure, 95
reclamation areas, 72	Soil Conservation Service, 65
soil types, 54	State Agricultural Experiment Stations, 61
stream flow, 49	Tax Assessment Procedure, 142
topographic mapping, 48	Tennessee Valley Authority, 117
drainage, range surveys, 96	forage, vegetation types, range surveys, 95

forest resources	land classification
grazing areas, 101	definition, 1
Indian reserves, 82, 84	origin, development, 10
Michigan, 103-	Land Committee (NRPB), recommendations, 23
New York, 125	land economic survey, Michigan, 103-
reserves, 16, 45	land ownership and use, reclamation projects, 74
Tennessee Valley Authority, 114	land purchase surveys, Indian, -84
Forest Service, U. S.	land speculation, 11 legislative backgrounds
origin, 16, 17	classification methods and policy, 10
surveys, 54	Forest Service, 54
General Land Office, U. S.	General Land Office, 39
administration of reserves, 17	Geological Survey, 44
origin and development, 10-	Grazing Service, 99
surveys of public lands, 39	Indian Affairs, 80
Geological Survey, U. S.	leasing system, public lands, 48-51
origin and development, 13, 15, 17	Michigan land economic survey, 103-6
surveys, 17, 44-	National Park Service, 86
grazing lands	Reclamation, Bureau of, 71
conservation surveys, 69	tax assessment procedure, 142
Indian reserves, 82	Tennessee Valley Authority, 111-,
range surveys, 18, 48, 51, 95	Lewis and Clark expedition, 12
Grazing Service, U. S., 99	line-plot method, timber surveys, 55
groundwater resources, 48	livestock resources
	El Dorado, California, 140
Hayden, F. V., geological surveys, 15	Grazing Service, 99
historical backgrounds	range land surveys, 96
Bureau of Reclamation, 71	Louisiana Purchase, 12
Forest Service, 54-	management recommendations practices 6-7
General Land Office, 39	management recommendations, practices, 6-7
Geological Survey, 44-	Mansfield, Jared, scientific survey methods, 10
Grazing Service, 99-	mapping techniques.
land classification in 19th Century, 10	aerial photography, 35, 48 forest areas, 54
Michigan, 103-	geological surveys, 45, 47
National Park Service, 86	land-use property surveys, New York, 127
Office of Indian Affairs, 80	national parks, 92
public lands, 39	range surveys, 97
reclamation and irrigation, 71	recreational areas, 92
township surveys, 41–42	soil conservation, 65
Tennessee Valley Authority, 111-	soil types, 58
historic sites, 86, 91	tax assessment, 143
homestead surveys, 45	topographic, 48
hydrographic surveys, 45, 47, 49, 82, 122	regional planning, 113, 117
	mineral lands, 18, 46
Indian Affairs, Office of, 29, 80	Mexican-United States boundary survey, 13
information services, records, data	Michigan land economic survey, 103
aerial photography, 38	Montana land surveys, 133
conservation surveys, 69	mosaics, aerial, 35-,
forestry surveys, 55-	modulos, activity of y
geological surveys, 48	National Academy of Sciences
grazing lands, 102	scientific survey practices, 15, 44
hydrological surveys, 51, 82, 122	national forest reserves, 16-17,
Indian reserves, 84	National Park Service
national parks, 92	origin and development, 18
public lands, 41	recreational areas, 86
range surveys, 97	scenic, historic sites, 86
reclamation surveys, 76	North Dakota
soil surveys, 63	tax assessment surveys, 142
topographic surveys, 51	Ward County, plan, 146
irrigation, administration and methods, 45, 71, 81	
	occupancy factors in classification, 4
King, Clarence, first director, U. S. G. S., 44	Office of Indian Affairs, 80

Index

optical apparatus, stereoscopic, 48	State agencies, activities
Otsego County, Michigan	agricultural experiment stations
land types inventory, 108-9	California, 31, 138
	Cornell University, 32
park, parkway, recreational area study, 87, 89	Georgia, 31
photography, aerial, 35, 48, 63, 67, 111,	Illinois, 31
Plant Industry, Bureau of, 26	Iowa, 32
population, distribution, U. S. (1930), 14	Kentucky, 32
Powell, J. W., geological surveys, 15-16	Michigan, 32, 34, 103
property classification maps, New York, 127	Minnesota, Univ., 32
public domain	Montana, 32, 133
acquisition of, 10	New Hampshire, 32
area of, 40	New York, 125
General Land Office, 39	North Dakota, 33
leasing system, 49–51	Oregon, 33
Putnam, Rufus, 10	Pennsylvania, 33
- u	Vermont, 33
rangeland surveys, 45, 82, 95, 99	Virginia, 33
reclamation of arid lands, 16, 45, 71	West Virginia, 33
recreational areas	Wisconsin College of Agriculture, 33
origin of policy, 18	State planning boards, 34
programs, 8, 18, 86, 103	stream gaging procedure, 49
rectangular system of land surveying	sucam gaging procedure, 19
origin and use, 10, 40	Taylor Grazing Act, 99
	tax assessment, 142
regional planning	·
Tennessee Valley Authority, 111	Tennessee Valley Authority
Roane County, Tennessee	administration of program, 8, 111,
productivity rating of soils, 60-61	soil types, 59
run-off characteristics of watershed areas, 48	timber resources surveys, 55
rural road surveys, New York, 129	time element affecting program, 7
•	topographic surveys (see individual agencies)
scenic resources	township survey plan
classification, 18	origin and development, 10, 40, 41-42
historic sites, 86	types of land classification, 3
inventory, 115	
Sierra Nevada foothills area, Calif., 138	unit-area surveys (TVA), 117
slope classes, 65	United States-Mexican boundary survey, 13
soil surveys	use-capabilities classifications, 4, 5, 59, 67, 142
Bureau of Plant Industry, 58	
Bureau of Reclamation, 74	Ward County, North Dakota, 146
origin and development, 17	water resources
Michigan, 106	. hydrographic surveys, 45, 47, 49
Montana, 133	Indian lands, 82
New York, 125	livestock, grazing lands, 96
Sierra Nevada, California, 138	reservoir property surveys, 122
Soil Conservation Service, 65	run-off characteristics of watersheds, 48
state and local, 17	Weather Bureau, soil surveys, 17
Tennessee Valley Authority, 113	Wheeler, George M., geological surveys, 15