LAND PLANNING AND CLASSIFICATION REPORT

PUBLIC DOMAIN LANDS

LITTLE MISSOURI RIVER BASIN

MONTANA, NORTH DAKOTA, SOUTH DAKOTA AND WYOMING

A MISSOURI RIVER BASIN INVESTIGATION

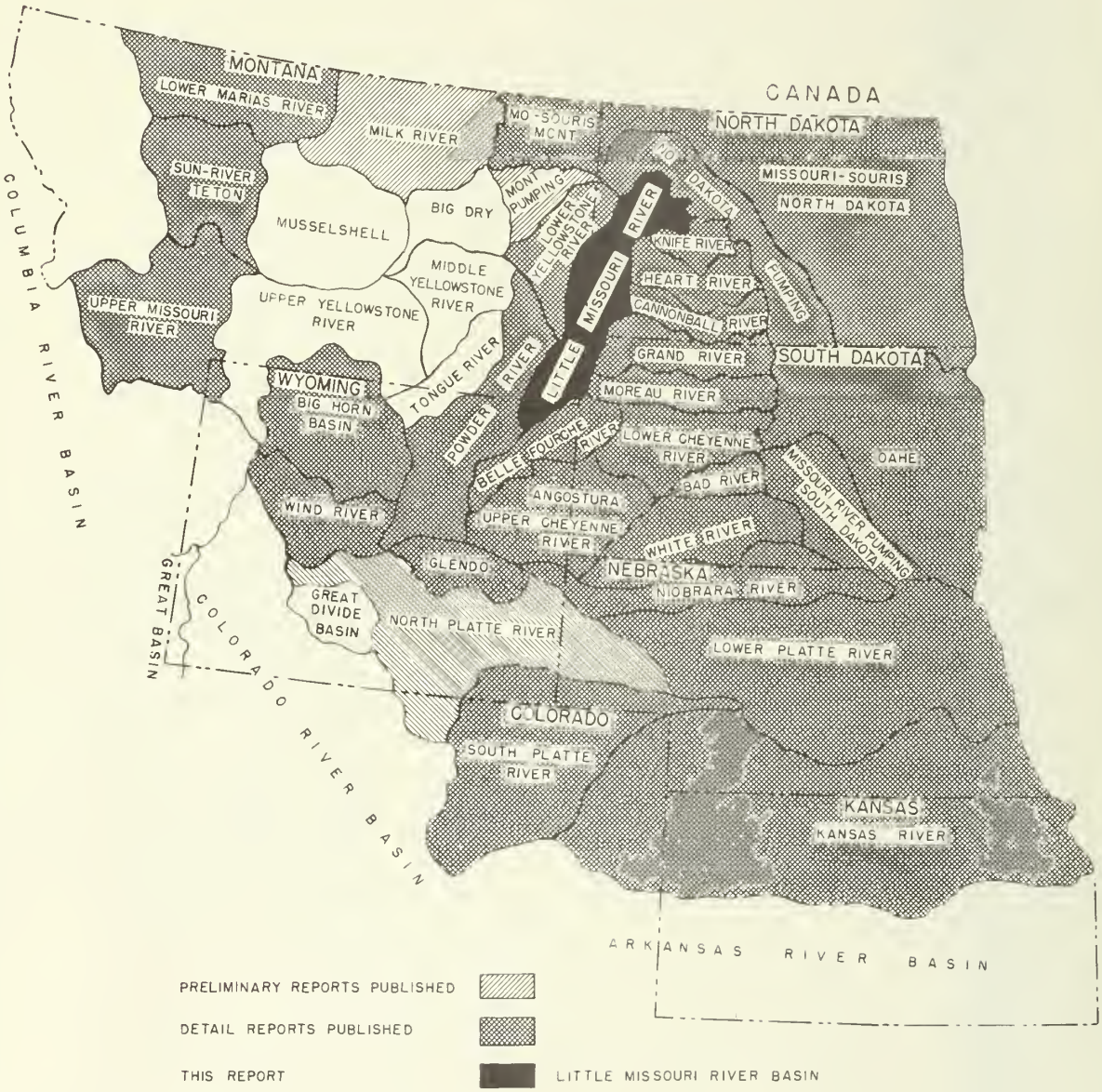
FOR ADMINISTRATIVE USE ONLY

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
AREA 3 DENVER, COLORADO
MAY 1959

20

PRESENT STATUS OF BUREAU OF LAND MANAGEMENT STUDIES IN THE MISSOURI RIVER BASIN

(LAND CLASSIFICATION)



GPO 858406

Land Planning and Classification Report
Public Domain Lands

LITTLE MISSOURI RIVER BASIN

MONTANA, NORTH DAKOTA
SOUTH DAKOTA AND WYOMING

A Missouri River Basin Investigation

For Administrative Use Only

Department of the Interior

Bureau of Land Management

Area 3

Denver, Colorado

May, 1959

The resource inventory and land status information contained in this report is based on data obtained by field examination and studies made prior to January, 1956. Changes in resource data or land status subsequent to January, 1956, are not necessarily in this report.

This report was compiled as a feature of the program of the Department of the Interior for the development, conservation and use of the resources of the Missouri River Basin.

TRANSMITTAL AND ACKNOWLEDGMENT

Little Missouri River Basin is located in four states. Most of this drainage is in North Dakota, a considerable part is in Montana and minor portions are in South Dakota and Wyoming. This basin is a tributary unit of the Missouri River Basin which is being studied in detail by the Department of the Interior in order to develop its maximum ultimate use. This report includes a resource and landownership inventory of the area. The area includes wide sweeps of badlands near the river with rolling and undulating land farther from the stream.

This report is based on field investigation of the public domain lands administered by the Bureau of Land Management and includes information from other agencies of the Federal Government. Several State offices of the four States within the basin have supplied data used in this report. Livestock operators and others utilizing resources of the area have also contributed valued information. Field investigations were conducted and the maps and this report were prepared by the Missouri River Basin Staff of the Bureau of Land Management, Area 3. The purpose of this report is to provide basic information for the greatest ultimate use development of the Little Missouri River Basin.

This report is a contribution by the Bureau of Land Management to the entire coordinated program of the Department of the Interior for the ultimate maximum development and use of the Missouri River Basin. This report will supplement similar studies for other tributary basins within the Missouri River Basin. The tributary basins for which reports have been completed are shown on the progress map which is the frontispiece of this report.

W. B. Wallace
Area Administrator

CONTENTS

FIGURES

TABLES

APPENDIXES

LITTLE MISSOURI RIVER BASIN MAPS

-in pocket on the back cover

LAND CLASSIFICATION MAP
in nine colors

POTENTIAL IMPROVEMENTS SITES MAP
in black, blue and purple

PUBLIC DOMAIN MAP
small maps in black and white

Sheet 1: North Dakota: Dunn and McKenzie Counties

Sheet 2: Montana: Fallon and Wibaux Counties. North Dakota: Billings, Golden Valley and Slope Counties

Sheet 3: Montana, South Dakota and Wyoming. North Dakota: Bowman County

INTRODUCTION

Little Missouri River Basin is a long narrow drainage arising in northeastern Wyoming and extending northward through Montana and South Dakota to its junction with the Missouri River in northwestern North Dakota. This drainage lies between the Yellowstone River Basin on the west and the minor tributary basins of the Missouri River on the east. Source of the Little Missouri is at the southern extremity between the Powder River drainage on the west and Belle Fourche River Basin on the east. The frontispiece report status map of this report shows the contiguous basin report areas. Final detailed Missouri River Basin reports have been prepared by the Bureau of Land Management for all of the surrounding basins, as shown on the frontispiece status map of this report.

The preliminary "Land Planning and Classification Report of the Public Domain Lands in the Little Missouri River Basin" was published by the Bureau of Land Management in June, 1954. That report proposed that the area classification method of detailed study be used for the regions of concentrated public domain land because of their important multiple use values and interrelationship of land uses. That report also stated that the public domain in this area be studied to determine its highest use and potentialities under properly integrated use. Individual examination was recommended for the scattered tracts of public domain in the balance of the basin. In the southern part of the basin public domain land is so concentrated that it was advisable to examine all types of landownership for an area of 915,634 acres divided into two parts. The Land Classification and Proposed Improvement sites Maps with this report are maps of the two study areas where all types of landownership were examined.

In addition to the study areas there are 868 tracts of public domain which include 97,143 acres. These isolated tracts of public domain were examined individually and land classification reports were completed to include each tract. The land classification report form used is shown in Appendix B of this report. Results of the examination of each tract are summarized in table 19 of this report. The description and classification summary of each tract is given on each line of table 19. Distribution of these isolated tracts by states and counties within the basin together with their consolidated classification is presented as a summary of table 19. Detailed studies of the public domain in this basin were completed in 1955.

Land classification reports for the individual isolated tracts are on file at the Montana Land Office in Billings, Montana.

Surface resources of the 915,634 acres in the area classification part of the basin were determined, evaluated and mapped in the field. Aerial photographs were utilized for field mapping, topography and cover type designation. Section corners, bench marks and other monuments were utilized for ground control points and were pin pointed on the field maps. Field maps were made showing surface resources of soil and vegetal cover by range site, vegetative type and the three principal species of plants. Soil depth, texture, permeability and parent material were determined and mapped. Range condition, Land Use Capability, erosion condition and the recommended stocking rate were also shown, along with existing land use. Drainage, landownership and all cultural features were mapped. The field maps were compiled into work maps of four townships each from which the completed color maps of the study areas were made. These color maps are with this report in the map jacket.

Little Missouri River Basin includes 6,632,160 acres, of which 547,366 acres are public domain. Most of the basin is in North Dakota, 3,608,800 acres being located there with 52,615 acres of public domain. Montana has 2,169,120 acres in the basin and 419,731 acres of public domain. Basin area in Wyoming is 461,440 acres with 66,038 acres of public domain. There are 392,800 acres of the basin in South Dakota with 8,982 acres of public domain. Total area of Federal lands in the basin is 1,818,429 acres. Federal lands are 547,366 acres public domain, 760,850 acres of Land Utilization Project acquired lands, 85,935 acres in the Custer National Forest, 358,720 acres of the Fort Berthold Indian Reservation and 65,558 acres in the Theodore Roosevelt National Park of the National Park Service. Total Federal land area is distributed among the four States as follows:North Dakota, 1,219,643 acres;Montana,516,756 acres; Wyoming,71,128 acres; and South Dakota, 10,902 acres.

Land Utilization Project acquired lands are the largest area of Federal lands in the basin. These lands were repurchased for conservation purposes during the drought and depression years of the 1930's under the Bankhead-Jones Act. Administration of Land Utilization Project acquired lands in the basin in Montana was transferred to the Bureau of Land Management from the Forest Service by Executive Order No. 10787 of November 7, 1958. This is an area of 13,010 acres in Fallon County.

The Forest Service continues to administer the Land Utilization Project lands in North Dakota, an area of 742,750 acres in Billings, Golden Valley, McKenzie and Slope Counties. The 5,090 acres of Land Utilization Project land in Wyoming within the basin also remains under the jurisdiction of the Forest Service. Federal landownership is designated on the maps with this report.

This report, with the accompanying maps, presents the results of the detailed studies of the basin. Land use is shown on the Land Classification maps with this report as cultivated and grazing land. The principal range plants of the area are listed in appendix A with the symbols used on the map. Land Use Capability is shown on the maps, and for each tract in table 19, by grade from I - VIII as described in appendix C of this report. Range types are described in appendix D. Range sites are listed and described in appendix E. Problems affecting public domain lands in the basin are a feature of this report.

GENERAL DESCRIPTION

Location and Size

The Little Missouri River is a sediment laden muddy stream arising in northeastern Wyoming at Flag Butte near Oshoto. Falling slowly, the stream winds its way northward through the southeastern corner of Montana and across the northwest corner of South Dakota into North Dakota where it flows into Garrison Reservoir near Oakdale, 560 miles from the starting point in Wyoming.

The basin is long and narrow with badlands along the stream most of its length. This is the only major tributary stream that flows northward into the Missouri. It is located between the eastward flowing minor tributaries and the Yellowstone River drainage on the west as shown on the frontispiece map of this report. The basin ranges from 26 miles to 57 miles in width, the average being about 35 miles. The total land surface natural drainage area of 9,500 square miles has been reduced to about 9,450 square miles, by the filling of Garrison Reservoir.

In addition to the Little Missouri River Basin there are about 863 square miles of minor drainages included in the area. These are small streams which drain directly into the Garrison Reservoir north of the basin. Largest of these small streams are Skunk Creek, Bear Den Creek, Clark's Creek, Antelope Creek and Tobacco Garden Creek.

Total report area is 10,363 square miles as mapped on the Little Missouri River Basin Public Domain Map with this report.

Location of the area within fourteen counties and four states is presented on the following page. Drainage areas and stream lengths of the Little Missouri River Basin are given in table 1 on page 6.

Area and length of the Little Missouri River Basin and of its principal tributaries is presented in table 1. Location of the entire area by Counties and States is as follows:

	Sq. Mi. in the Area	Percent of Total County in the Area
Montana	3,389	
Carter	2,431	73.4
Fallon	575	35.2
Powder River	7	0.2
Wibaux	376	42.3
North Dakota	5,639	
Billings	810	71.1
Bowman	480	41.1
Dunn	808	39.1
Golden Valley	959	94.6
McKenzie	1,811	64.5
Slope	771	62.9
South Dakota	614	
Harding	611	22.8
Butte	3	0.1
Wyoming	721	
Campbell	58	1.2
Crook	663	22.9
Total-14Counties	10,363	36.8

Table 1. - River lengths and drainage areas, Little Missouri River Basin, Montana, North Dakota, South Dakota and Wyoming

	Distance Above Mouth (miles)	River Length From Source (miles)	Drainage Area Square Miles	Portion of Drainage Area (%)
Little Missouri River				
Entire Drainage	0.0	560.0	9,500	100
Medora, North Dakota	187.9	372.1	6,323	67
Dam Site No. 1	241.3	318.7	5,292	56
Dam Site No. 2	245.8	314.2	5,271	55
Keogh Dam Site	255.0	305.0	5,238	55
Camp Crook, So. Dak.	409.0	151.0	1,931	20
Near Alzada, Montana	467.0	93.0	831	9
At Alzada, Montana	472.5	87.5	640	7
Tributaries				
Cherry Creek	60.5	56.	357	4
Beaver Creek	137.5	120.	793	8
Little Beaver Creek	306.4	81.	633	7
Boxelder Creek	351.7	119.	1,239	13
Willow Creek	466.0	42.	204	2
Thompson Creek	469.0	49.	180	2
North Fork	504.0	31.	187	2
Major Tributaries, Total			3,593	38
Minor Tributaries and Main Drainage			5,907	62

Compiled from Missouri River Basin River Mileage and Drainage Areas, Corps of Engineers, Missouri River Division, Omaha 1, Nebraska, June 1949.

Topography

Much of the area is made up of badlands, hills, buttes and rough country with local changes in elevation of up to 300 feet. Several buttes rise more than 400 feet above the surrounding plain. Local relief is over 700 feet in the Short Pine Hills in South Dakota and is even more in the Killdeer Mountains in North Dakota near the mouth of the river. About twenty per cent of the area is level to gently rolling, eighty per cent being rolling to rough. Extensive areas of shale hills and badlands occur west of the stream in Carter County, Montana, and border the stream on both sides virtually from Slope County northward in North Dakota. The level valley floor of the Little Missouri River is mostly one-half to one mile wide. In places it runs between steep badlands on both sides, and in other locations widens to five miles as in South Dakota for a distance of eight miles north of Camp Crook. Several of the tributaries also have wide valleys, notably Valley Creek in South Dakota.In addition to this level land there are several considerable areas of high plains away from the river in all of the four state area. The stream of the Little Missouri River is within a definite well cut channel which meanders tortuously in the valley floor for most of the stream length. This channel has such steep banks that the stream cannot be readily crossed by livestock or vehicles. While these channel walls are usually less than ten feet above the stream bed, their slope over most of the stream's course prevents crossings except at points where natural conditions or man-made cuts make fording feasible. This channel is sufficiently narrow and stable so that it can be readily bridged at most points. Many of the tributaries have less well defined channels and present difficulty in road construction and maintenance in parts of the basin.

At the headwaters in the Wyoming part of the basin, a sloping plain extends eastward from the Powder River Divide for several miles providing soil and slopes suitable for cropland. On the southeast side of the river along the Belle Fourche Divide, sandstone caprock breaks off sharply over shale outcrops to the valley bottoms. The Montana portion of the Little Missouri Basin is characterized by broad sloping plains bordered by shale hills which are often badlands and are sometimes capped by remnants of the formerly overlying sandstones. Drainage channels, often straight near the divides, soon deteriorate to meandering courses across the flatter lands. Differences in elevation between main

channels and the high points of the sandstone cap rock seldom exceed 500 feet. As the river progresses downstream, through the northwest corner of South Dakota into North Dakota, the slopes between the river bottom and the uplands become increasingly steep and more sharply cut. Along the lower part of the river, north of Marmarth, North Dakota, these slopes become typical badlands frequently extending several miles on either side. Large badlands areas in the basin in Montana and North Dakota are spectacular, fantastic, colorful and intriguing. Elevations vary from 4,600 feet on Flag Butte at the source of the river in Wyoming to 1,900 feet at the mouth of the stream in North Dakota where it enters the Garrison Reservoir.

Geology

The Little Missouri River Basin is located in the central portion of the Missouri Plateau division of the Great Plains physiographic province. It adjoins the Powder River and Lower Yellowstone River Basins on the west. The basin formerly consisted of broad rolling upland surfaces that since have been extensively eroded into breaks and badlands. This is particularly true in the lower reaches from the southwest corner of North Dakota to its confluence with the Missouri River. In the upper reaches, surfaces are broader with only local dissection into breaks and badlands. The Little Missouri River flows in a comparatively broad shallow valley which deepens somewhat in the lower reaches. It is a very meandering stream of 560 miles that nearly doubles its length by its meanders. Its headwaters are at an elevation of about 4,600 feet above sea level at Flag Butte, Crook County, Wyoming, and it flows into the Missouri River at a little less than 1,900 feet above sea level, giving it an average gradient of about 4.82 feet per mile. However, the gradient varies from a maximum of about 40 feet per mile at its headwaters to a minimum of about 1.85 feet per mile in its middle reaches.

During its early geologic history, the Little Missouri River flowed into the Missouri River through the valley of Tobacco Garden Creek. Instead of turning eastward at the bend in the southeast corner of T. 147N., R. 102W., 5th P.M., North Dakota, the river probably continued northeastward through the gap of Bowline Creek and onward into Redwing Creek, Cherry Creek and Tobacco Valley Creek from which it flowed into the Missouri. During Pleistocene time glaciers moving south and westward extended to points south of the present position of the Missouri River in North Dakota as evidenced by the

presence of glacial boulders, pebbles, and deposits of glacial till. The glacier, either Iowan, a substage of the Wisconsin, or else Illinoian, dammed the waters of the Missouri, Yellowstone and Little Missouri Rivers, causing them to flow eastward. After the retreat of the ice sheet, the waters of the Little Missouri River did not return to the old water course, but continued to flow eastward past the north end of the Killdeer Mountains.

The change in course of the Little Missouri River had some effect on the action of the river itself and resulted in considerable rejuvenation of its tributaries flowing from the Killdeer Mountains area, causing rapidly increased erosion and carving of the mountains into their highly sculptured form of today with deep canyons and sharp peaks. Throughout most of its course, the Little Missouri is overloaded with sediment except during flood stages. The larger side valleys have flat to broadly rounded bottoms, but the smaller tributaries form a labyrinth of gullies.

The level of the crests between the badland gorges near the river is generally not quite as high as the adjacent upland, indicating that, before the cycle of badland erosion, the river occupied a shallower valley perhaps 300 feet deep at the most and probably much narrower than the present dissected zone. The river has now entrenched itself beneath the old valley bottom to depths varying from 80 feet where it enters North Dakota to 300 feet near the bend. East of the bend the river is flowing in its post glacial channel and the entire depth of cutting, amounting to about 550 feet, is in the upland. Thus it is apparent that the vigorous badland erosion cycle is advancing upstream.

The Little Missouri River basin is not an area of great crustal disturbance and the rocks for the most part are gently dipping. The main exceptions are the Cedar Creek anticline, a minor flexure trending northwest on the southwest edge of the Williston Structural Basin and the Black Hills uplift, the center of which is the Black Hills to the southeast. The Cedar Creek anticline extends into the basin near the center at the southwest corner of North Dakota and separates the Northern portion which is in the Williston Basin from the southern portion which is on the northwest flank of the Black Hills uplift. It is on the flanks of the Black Hills uplift in Wyoming that the oldest rocks of the basin are exposed.

The rock formations exposed in the Little Missouri River Basin are of sedimentary marine and continental origin, ranging in age from upper Jurassic to recent. The surface of the basin north of the Cedar Creek anticline is developed on the Teriary Fort Union formation which consists of sandstones, shales and lignite beds. All of the younger beds have been removed except for small remnants of the White River formation capping the peaks of the Killdeer Mountains. Between the Little Missouri and the Missouri River are deposits of glacial boulders, gravel till of Pleistocene Age and present-day alluvium in the river bottoms.

On the southwest flank of the Cedar Creek anticline in Montana is a wedge-shaped section of the upland extending southeast into the basin between the Cedar Creek anticline and the Black Hills uplift from which the Fort Union formation has not been removed. This upland area contains two erosion remnants of younger formation known as the Ekalaka and Long Pine Hills areas. These hills are capped by the Tertiary Arikaree formation underlain by the White River and Fort Union formations. A few miles to the southeast and just west of Harding in Harding County, South Dakota, are the West Short Pine Hills, another erosion remnant capped by the Tertiary Arikaree and White River formations.

The southern portion of the Little Missouri Basin crosses the northwest and part of the western flanks of the Black Hills uplift in South Dakota, Montana and Wyoming. The oldest formation exposed in the basin, the Morrison formation of Jurassic age, is only exposed in Wyoming at several points along the southeast border of the basin. Subsequent formations include the Inyan Kara group, Graneros formation containing bentonite deposits, Greenhorn limestone, Carlile shale, Niobrara formation, Pierre shale, Fox Hills sandstone and Hell Creek shale, all of the Cretaceous age; and along the west side of the southern tip of the basin the Tullock member of the Fort Union formation of Tertiary age is exposed. At the southern tip of the basin the rocks trend northerly and are dipping more or less steeply in a westerly direction but swing roughly parallel with the river to a northeasterly direction with a gentle northwesterly dip where the river turns to a northeasterly direction.

In the Little Missouri River Basin, the Graneros formation of Cretaceous age contains the important deposits of bentonite and the Fort Union formation contains the important lignite beds and deposits of scoria formed from the burning of the lignite beds at their outcrops. Uranium is produced from the Lakota formation in Wyoming.

FIGURE 1. - SOILS MAP OF THE LITTLE MISSOURI RIVER BASIN MONTANA, NORTH DAKOTA, SOUTH DAKOTA AND WYOMING, 1958

Source: United States Department of Agriculture, Bureau of Chemistry and Soils. Atlas of American Agriculture Part III, Soils of the United States, Plate 3, Section 5

Some uranium mineralization has been found in the Cretaceous Hell Creek formation and Tertiary Fort Union, White River and Arikaree formations as described in the Minerals Section of this report.

Soils

Soils of the Little Missouri River Basin vary greatly due to variations in site and topography. A large part of the area, especially in North Dakota, is rugged badlands with many steep slopes with raw shales or clays. Soils with considerable depth and good texture occur on the valley floors of the drainages and on adjacent terraces. Rolling plains at the headwaters in Wyoming and South Dakota have considerable area of soils with good topography, ample depth, and with good texture and permeability. Some similar areas are also found on the borders of the basin in Montana and North Dakota. The Soils Map, figure 1, shows the distribution and location of soil types in the area on a broad generalized basis.

Soil characteristics have been considered in the field inventory of public domain lands and of related lands in the area classification portion of the basin. The Little Missouri River Basin Land Classification Map with this report shows the soil characteristics for 915,634 acres, 450,223 acres being public domain. Soil characteristics are shown for 736 separate areas varying from 87 to 15,360 acres in size. Soil characteristics shown are depth, texture, permeability, and type of underlying or parent material. Associated land features of range site, slope and erosion condition are also given for each area as explained on the Land Classification Map.

Detailed soil surveys are available for McKenzie and Billings Counties, North Dakota. Sixty-three per cent of both McKenzie County and Billings County is within the basin. In McKenzie County, as in all of the area, land use is closely related to relief. There are few large bodies of definite cropland; large areas, because of extreme relief, are suitable only for grazing; and there are extensive areas that are an intricate mixture of crop and grazing land. The soil survey of this county, series 1933, No. 37, published in 1942, reports only 20,992 acres of good cropland. There are 698,944 acres of fair cropland and 990,144 acres of grazing land in the county for a total county area of 1,710,080 acres. Good cropland covers 1.2 per cent of the county, fair cropland includes 40.9 per cent and grazing land makes up 57.9 per cent of the county area. Cropland makes up 42.1 per cent of the county area.

Areas of 14 soil types in McKenzie County are listed below. Areas of these types are also given for cropland and grazing land. Portion of the county covered by each class and type is also given.

Soil Type	Cropland		Grazing Land		Total	
	Acres	% of County	Acres	% of County	Acres	% of County
Loam	207,232	12.12	160,384	9.38	367,616	21.50
Silt loam	77,376	4.52			77,376	4.52
Silty clay loam	112,704	6.59	1,984	.12	114,688	6.71
Fine sandy loam	62,464	3.65	35,072	2.05	97,536	5.70
Very fine sandy loam	22,976	1.34	1,792	.11	24,768	1.45
Clay loam	208,064	12.17	365,824	21.39	573,888	33.56
Silty clay	29,120	1.70	7,808	.46	36,928	2.16
Clay			31,488	1.84	31,488	1.84
Loamy fine sand			105,856	6.19	105,856	6.19
Gravelly loam			3,840	.22	3,840	.22
Loamy very fine sand			3,008	.18	3,008	.18
Scoria			62,208	3.64	62,208	3.64
Rough broken			204,352	11.95	204,352	11.95
River wash			6,528	.38	6,528	.38
McKenzie County Total	719,936	42.09	990,144	57.91	1,710,080	100.00

All of the cropland in the above list is of fair quality except 20,992 acres, or 1.23 per cent of McKenzie County, which is classed as good cropland.

Fifty-nine soils are described, classified and given productivity ratings in the Soil Survey of Mc Kenzie County. Grazing capacity of these soils varies from no value to 1.3 acres per animal unit month on the best soil, Arnegard silt loam. The better soils have grazing values ranging from 1.3 acres per animal unit month to 2.5 acres per animal unit month. Distribution of soils within the area is roughly proportional to the above listing.

The Soil Survey of Billings County, North Dakota, series of 1934, No. 25, was issued in June 1944. The map of surface features and drainage in this report shows that nearly all of the Little Missouri Basin drainage in this county is badlands. Nearly all of the badlands here are classed as relatively bare, only about four townships being considered to be relatively grass covered. The only good land in the drainage is the small part which is in the valley floor and an old high terrace. Nearly all of the smooth to rolling uplands in this county drain eastward outside of the basin. This survey lists 64 soil types in 18 series, which are about the same as in Mc Kenzie County.

The Reconnaissance Soil Survey of western North Dakota, 1908, is the only published source of soils information for the other North Dakota Counties in the area. The map with this report shows that more than half of Golden Valley County is Morton loam, nearly all of which is undulating to rolling. The balance of the county is rough broken land. Ninety-five per cent of this County is within the area. Slope County within the basin shows as being about 40 per cent Morton loam, nearly all of which is undulating to rolling. Sixty per cent shows as rough broken land. The part of Bowman County within the basin is mapped about equally between Morton loam and rough broken land with nearly half of the Morton loam being sharply rolling to hilly. Slope County has 63 per cent of its surface within the basin and 41 per cent of Bowman County is within the basin. Dunn County, 39 per cent of which is within the area, shows on the Reconnaissance Soil Survey map as being about one-half of rough broken land and one-half as being in the Killdeer Mountains for the part of the County within thebasin. Very Little Morton loam is within the basin in this County.

The Reconnaissance Soil Survey of Western South Dakota, 1909, published in 1911, is the only publication available for soils information in the South Dakota portion of the Basin. The map with this report shows most of this land to be Morton and Wade loams, much of it being very rolling to hilly. There is a large area of badlands on the eastern divide

and along the state line in Harding County. There is an area of Wade clay loam in the vicinity of Camp Crook on the floor of the Little Missouri Valley. Wade and Pierre clays and clay loams are found in half of a township at the head of the drainage in South Dakota.

Soil survey information is not available for the Montana part of the area. The Geologic Map of Montana shows the following areas of parent material in Carter, Fallon, Powder River and Wibaux Counties within the Montana sector of the basin:

Formation:	Area acres
Pierre shale	818,960
Niobrara, Carlile, Belle Fourche, Mowry and Greenhorn shales	174,320
Alluvium	130,240
Hell Creek sandstone, shaly clay and mudstone	248,960
Fort Union clay shale, siltstone and sandstone	630,880
Arikaree sandstone	32,560
Fox Hills sandstone	110,160
White River clay and sandstone	23,040
Montana-Total	2,169,120

Shale formations dominate the area. This parent material produces clay or clay loam soils. Sandstones, which would produce sandy or loamy soils are parent material of only a minor portion of the area. Considerable areas of "scabland" range sites in the area are clay loam and silty clay loam soils with a Solenetz type profile with a definite shallow clay pan which surfaces in numerous bare spots. The clay pan spots are below the surrounding soil by a few inches to a foot or more and vary greatly in size from a square yard to an acre or more which may have the characteristics of an intermittent lake. These pan spots always fill with water during periods of rainfall or runoff and the water remains until it evaporates, as very little penetrates the clay pan. Surface and internal drainage is very slow, although some areas on slopes are provided with fair to good surface drainage. Most of these "scabland" soils are on alluvial flats in stream valleys or in badland basins. These soils are in Rhoades, Patent and Moline series or in complexes of these with other soils. The Wade-Farland silty clay loams, found on

Alluvial flats in the badlands, have numerous bareclay spots along with frequent bare "puff" spots caused by soluble salts. These unusual soil features are termed Solonchaks. These puff spots are 4 to 12 feet in diameter and are one-half to one foot above the surrounding soil. These bare, loose, fluffy spots cover 40 to 85 per cent of this soil type.

Climate

Because of the severe cold winters in the area the badlands are valuable shelter areas for livestock against winter storms. Summers are hot and often dry, although the bulk of the precipitation falls as rain during the growing season. Precipitation is erratic and undependable but is usually ample to produce good range vegetation and satisfactory crops on good sites. Hail storms are a feature of the region. The area of highest average annual hail damage in the country extends into the basin in North Dakota. Hail damage occurs within the basin every year, varying greatly in area and extent. It is usually limited to localized areas, but is occasionally extensive. Climatological data for thirteen stations in and near the basin are presented in table 2. Data is given for temperature, precipitation, average frost dates, average length of frost-free period, and years of record for each of the stations. Temperature figures show little variance between stations. This is probably accounted for because the higher elevations largely occur near the southern source and the lower elevations are further north near the mouth of the stream. Average frost-free days vary from 111 to 139. Average annual precipitation also shows considerable variation, from 12.29 inches to 17.61 inches among the 13 stations.

Winters are usually severe, blizzards and protracted cold spells being expected fare. Occasional winters are fairly open and mild. Some protracted cold spells may be accompanied by blizzards, which pile snow in huge drifts. These conditions disrupt traffic and cause livestock losses. Cold winters and hail affect agricultural practice in the area. Production and storing of winter feed crops is more common than in more favorably situated areas. Livestock are commonly kept to utilize crops which may have to be salvaged by feeding rather than to be harvested as cash crops. Dairy cattle and poultry are kept on most farms and ranches to augment the income in case of short crop production due to hail or drought.

Table 2. - Climatological Data for Stations in or Near Little Missouri River Basin, Montana, North Dakota, South Dakota and Wyoming

Station	Temperature in °F Jan. Mean	July Mean	Max.	Min.	Average Dates Killing Frost Last in Spring	First in Fall	Avg. Days Frost Free (No.)	Avg. Annual Ppt. (inches)	Elevation + MSL (feet)	Years of Record (Temp)	(Ppt)
Montana											
Baker	15.6	71.4	112	-50	May 9	Sept 25	139	13.31	2,934	11	21
Ekalaka	17.9	70.9	108	-43	May 19	Sept 23	127	13.27	3,434	50	58
Wibaux	16.2	69.0	110	-55	May 25	Sept 13	111	15.52	2,647	18	20
North Dakota											
Beach	11.2	69.5	110	-43	May 19	Sept 20	124	15.14	2,824	36	33
Bowman	14.2	70.9	112	-43	May 16	Sept 22	129	14.73		19	24
Marmarth	13.7	71.1	108	-52	May 17	Sept 20	126	14.14	2,714	24	30
Medora	14.8	68.5	114	-52	May 21	Sept 9	111	16.02		14	18
Watford City	9.0	70.7	112	-45	May 17	Sept 21	127	14.70	2,100	23	26
South Dakota											
Camp Crook	16.7	71.2	114	-57	May 20	Sept 21	124	13.89	3,120	36	35
Ludlow	17.0	71.5	113	-37	May 13	Sept 25	135	12.29		15	15
Redig	15.2	71.3	111	-46	May 17	Sept 23	129	12.67	2,989	24	24
Wyoming											
Colony	20.6	72.8	111	-39	May 14	Sept 29	138	15.80	3,500	24	25
Rockypoint	17.7	71.7	106	-45	May 20	Sept 25	128	17.61	4,050	16	28
Station Avgs.	15.36	70.8	111	-46.7	May 17	Sept 21	127	14.54	2,331	24	27

Climatological Data, Montana, North Dakota, South Dakota and Wyoming Annual Summaries for several calendar years, varying with station records, 1957 and prior; U.S. Dept. of Commerce, Weather Bureau.

Climate of the area permits the production of corn and this is the third most important crop in the area on an area harvested basis. Wheat is the leading crop, followed by hay. Climatic conditions favor the production of wheat and hay. Corn is grown as an intertilled crop following small grain, often in alternate strips with grain to prevent soil blowing and damage to the small grain crop. Corn is favored for this use because of its ability to break the force of winds and also because of the value of the stalks for roughage for livestock. Operators state that the crop of corn can be produced at a cost equivalent to summer fallow with the advantage of additional feed and potential income.

Annual and seasonal rainfall is usually sufficient to produce good yields of range forage and is also usually ample to produce fair to good crops of hay, grain and flax without irrigation. Frequently there are drought periods as long as six weeks during the growing season. Cyclical droughts with seasons of low rainfall also occur in common with the rest of the Great Plains province.

Annual precipitation at three stations in Montana and at five stations in North Dakota for the period 1918 to 1957 is given in table 3. This table shows wide variation in annual precipitation among years and stations. This wide variation in precipitation is a potential measure of variation in the production of range forage and dry farmed crops.

Annual precipitation at three stations in South Dakota and at three stations in Wyoming for the period 1918 - 1957 is presented in table 4. Consideration of the annual precipitation figures in tables 3 and 4 shows the wide variations between years and between stations. Moisture supply is usually the limiting factor in the production of range forage and crops in this area. The variations in amounts of precipitation in different years and at different locations in the area in the same year, show how greatly production is affected by available precipitation.

Table 3.- Annual precipitation at stations in or near the Little Missouri River Basin; Montana and North Dakota, 1918 - 1957

Year	MONTANA				NORTH DAKOTA					
	Ekalaka	Plevna	Wibaux	Avg.	Beach	Dick-inson	Mar-marth	Watford City	(near) Williston	Avg.
1918	13.50	-	14.31	13.90	11.00	12.36	15.86		13.84	13.26
1919	6.32	7.26	12.09	8.55	-	8.37	8.17		13.42	9.98
1920	-	17.14	13.19	15.16	11.50	15.81	12.73		13.13	13.29
1921	11.05	14.00	14.91	13.32	16.96	15.76	14.71		17.43	16.21
1922	-	18.41	15.62	17.01	16.30	18.20	-		20.00	18.16
1923	-	16.71	17.59	17.15	15.66	19.67	-		17.00	17.44
1924	14.70	13.57	-	14.13	12.24	15.13	16.27		17.43	15.26
1925	14.57	12.19	-	13.38	10.34	12.19	-		15.44	12.65
1926	11.96	11.60	-	11.78	10.01	13.11	13.07		12.36	13.13
1927	18.60	18.34	-	18.47	19.89	19.62	20.17		19.31	19.74
1928	15.09	12.53	-	13.81	13.64	15.30	-		15.26	14.73
1929	17.61	14.49	-	16.05	22.36	17.21	17.77		14.65	17.99
1930	12.13	14.60	-	13.36	15.00	13.79	15.71		11.74	14.06
1931	10.81	7.79	-	9.30	10.51	16.17	13.20		7.78	11.91
1932	14.42	15.47	-	14.94	20.45	17.24	17.14		17.74	18.14
1933	11.68	14.12	-	12.90	15.46	11.50	14.98		15.44	14.34
1934	7.09	6.92	-	7.00	6.21	7.91	7.70		6.13	6.98
1935	11.32	12.58	-	11.95	17.09	15.00	12.35		15.73	15.04
1936	6.35	9.29	-	7.82	6.50	6.72	6.31	9.41	8.50	7.00
1937	12.08	11.94	-	12.01	13.26	16.28	14.52	14.60	9.69	13.43
1938	10.07	16.53	-	13.30	13.93	16.65	14.63	17.14	15.71	15.23
1939	12.91	17.44	-	15.17	11.73	15.75	15.09	12.50	13.48	14.01
1940	17.49	17.29	-	17.39	16.42	17.12	16.23	19.17	14.10	15.89
1941	20.25	22.61	-	21.43	21.28	31.16	19.17	21.59	17.39	22.25
1942	16.48	15.98	-	16.23	15.53	19.75	18.87	13.67	16.04	17.54
1943	14.48	12.94	-	13.71	15.44	15.06	17.52	20.08	16.92	16.23
1944	16.33	15.24	-	15.78	-	20.63	18.73	19.58	17.90	18.98
1945	13.41	10.03	-	11.72	-	12.22	13.79	14.12	11.82	12.69
1946	18.41	17.26	13.55	16.40	-	14.50	19.26	18.18	14.63	15.39
1947	12.99	14.53	15.44	14.32	-	18.86	18.34	18.96	16.95	17.90
1948	14.46	15.23	16.06	15.25	-	16.11	18.81	16.57	14.33	16.41
1949	-	9.41	9.51	9.46	8.80	10.77	11.64	11.28	9.39	10.33
1950	14.39	12.18	-	13.28	18.56	15.13	14.05	-	19.60	16.30
1951	12.55	12.32	11.40	12.09	-	16.70	16.42E	13.18	12.13	14.45
1952	7.45	6.67	8.50E	7.54	8.89	11.97	8.82	13.43	11.38	10.33
1953	18.11	15.05	15.49	16.21	17.30	19.39	16.25	25.55	18.74	17.82
1954	12.64	9.13	17.69E	13.15	17.43	16.33	14.53	16.75	15.73	16.20
1955	15.73	11.53	9.39	12.21	12.05	14.65	10.62E	16.37	12.09	12.32
1956	12.14	9.41	9.48	10.34	9.97	12.70	-	14.71	11.20	10.85
1957	13.45	12.04	16.62	14.48	17.95	22.15	-	15.48	11.38	17.99
Period Avg.	13.67	13.37	13.57	13.53	14.22	15.62	14.80	16.30	14.32	14.79
Avg. Record Yrs.	13.27	13.39	13.39	13.42	15.14	15.80	14.14	14.70	14.68	14.95
No. of Record Yrs.	59	45	22	42	45	66	48	45	79	59
Elevation, MSL, Ft.	3,425	2,757	2,670	2,951	2,824	2,714	2,714	2,100	1,877	2,395

E - figure has been partly estimated.

Climatological Data, Montana and North Dakota, Annual Summaries for the years listed, 1918 - 1957; U.S. Department of Commerce, Weather Bureau.

Table 4.- Annual precipitation at stations in or near the Little Missouri River Basin; South Dakota and Wyoming, 1918 - 1957

Year	SOUTH DAKOTA				WYOMING			
	Camp Crook	Orman	Redig	Avg.	Colony	Sun-dance	Rocky-Point	Avg.
1918	-	17.97	12.37	15.17	18.47	-	-	18.47
1919	-	13.34	9.27	11.30	13.38	19.33	13.23	15.31
1920	15.35	21.66	15.59	17.53	18.75	25.40	19.71	20.06
1921	10.09	9.11	10.23	9.81	13.28	17.24	15.40	14.11
1922	20.85	20.78	21.63	21.08	24.66	27.81	22.69	22.62
1923	-	23.61	17.31	20.46	29.37	27.25	24.81	27.15
1924	12.81	13.10	16.53	14.14	18.23	16.60	16.99	16.43
1925	-	12.87	-	12.87	15.02	23.37	16.59	17.41
1926	15.40	14.89	15.45	15.24	17.09	-	21.45	16.77
1927	24.07	20.39	20.26	21.57	24.10	-	26.96	24.89
1928	12.77	11.89	16.99	13.88	17.38	-	19.39	18.19
1929	17.83	-	17.85	17.84	19.12	-	21.37	20.48
1930	16.33	8.70	11.34	12.12	11.62	14.70	13.55	13.29
1931	11.59	8.75	11.42	10.58	10.47	16.38	14.39	13.74
1932	14.72	19.80	16.27	13.59	14.29	17.32	17.57	16.39
1933	12.57	16.73	12.63	13.97	12.95	17.10	17.90	15.98
1934	6.50	11.38	9.64	9.17	7.44	12.33	15.61	11.79
1935	12.38	11.55	11.56	11.83	12.80	17.68	15.82	15.43
1936	4.33	8.07	6.01	6.13	6.58	11.69	10.48	9.58
1937	15.95	18.29	14.81	16.35	16.51	16.33	19.43	17.42
1938	14.49	10.35	9.85	11.56	13.70	13.99	17.92	15.20
1939	14.20	10.49	8.47	11.05	11.80	-	17.75	14.77
1940	14.58	15.39	12.95	14.30	16.50	19.72	19.90	18.70
1941	19.88	24.01	18.37	20.75	25.00	16.08	20.42	20.50
1942	15.54	19.19	14.01	16.34	17.86	24.56	18.99	20.47
1943	12.88	13.16	13.69	13.24	12.32	15.75	15.36	14.47
1944	16.09	19.68	19.56	18.44	22.75	20.20	26.16	23.03
1945	12.32	12.63	10.62	11.85	13.42	-	17.89	15.65
1946	19.50	24.40	20.05	21.31	25.91	-	21.56	23.73
1947	10.84	14.55	12.74	12.71	15.92	14.67	19.47	16.68
1948	15.55	15.66	14.86	15.35	16.00	11.99	21.44	16.47
1949	12.03	11.17	9.46	10.88	15.33	-	17.20	16.26
1950	12.71	12.36	-	12.53	-	13.20	-	12.13
1951	-	16.35	11.56	13.95	18.03	17.96	15.66	16.55
1952	9.90E	9.36	9.59	9.61	9.51	12.95	-	11.02
1953	15.22E	15.23	14.71	15.05	20.81	15.83	15.47	17.37
1954	11.05	13.25	10.65	11.65	10.95	11.58	10.08	10.87
1955	24.17	14.26E	10.30	16.24	12.17	20.37	16.35E	16.29
1956	9.56	11.69	12.50	11.25	11.47	12.11	12.60	12.06
1957	12.06E	14.66	16.32	14.34	17.62	16.67	17.68	17.32
Period Avg.	14.17	14.89	13.61	14.17	16.11	17.36	17.97	16.87
Avg. Record Yrs.	13.89	15.06	12.67	13.87	15.80	19.17	17.61	17.52
No. of Record Yrs.	64	52	43	53	42	34	43	40
Elevation, MSL, Ft.	3,120	2,933	2,989	3,014	3,500	4,750	4,050	4,100

E - figure has been partly estimated.

Climatological Data, South Dakota and Wyoming, Annual Summaries for the years listed, 1918 - 1957; U.S. Department of Commerce, Weather Bureau.

Extremes and means of annual precipitation within the area, as given in tables 3 and 4 are presented in the following tabulation. Extremes are shown for the lowest and highest recording at any station in each of the four states, and also for the means of the recordings for each state and also of those for all of the stations listed. Means are shown for the stations in each state and for all the stations as listed in tables 3 and 4. Period of record extends from 1918 to 1957. Average annual precipitation for the area is 14.91 inches. Lowest for the area is 4.33 inches at Camp Crook, South Dakota in 1936. Highest record is 31.16 inches at Dickinson, North Dakota in 1941. Lowest rainfall over the area averaged 7.71 inches in 1936, and the highest averaged 21.32 inches in 1941.

	Lowest	Highest	Average
	Annual precipitation inches	Annual precipitation inches	Annual Precipitation inches
Montana:extreme station	6.32	22.61	
Avg. 3 stations	7.00	21.43	13.42
North Dakota:extreme sta.	6.13	31.16	
Avg. 5 stations	6.98	22.25	14.95
South Dakota:extreme sta.	4.33	24.17	
Avg. 3 stations	6.13	21.57	13.87
Wyoming:extreme station	6.58	29.37	
Avg. 3 stations	9.58	27.15	17.52
Area Average			
All stations	7.71	21.32	14.91

Amounts of annual precipitation are compared with the long time average amounts for 19 stations in or near the area over a six year period in table 5. The difference between the annual precipitation in the odd and even years, 1952 - 1957, at each station is shown in inches and as a percent of the long time average annual precipitation. The comparisons for 1952 and 1953 are contrasting as 1952 was a "dry"year and 1953 was a year of unusually high precipitation. Data in table 5 further emphasizes the variations in the production potential for range forage and non-irrigated crops in the area. In nearly all of the area soil and site conditions are such that the amount and effectiveness of precipitation are usually the governing factors for the amount of production.

Table 5.- Comparisons of annual and long-time average amounts of precipitation for stations in or near the Little Missouri River Basin in Montana, North Dakota, South Dakota and Wyoming, 1952-1957

Station	Precipitation (inches)	Percent of Avg. (percent)	Precipitation (inches)	Percent of Avg. (percent)	Long Time Avg. (inches)	Variation Total Variation (inches)	Variation Percent of Avg. (percent)
	1952		1953			Variation 1952-1953	
Montana							
Wibaux 2E	8.50	55	15.49	100	15.52	6.99	45
Ekalaka	7.45	56	18.11	135	13.39	10.66	80
North Dakota							
Beach	8.89	59	17.30	114	15.14	8.41	56
Ryder	14.63	96	15.47	101	15.24	.84	6
Watford City	13.43	91	25.55	174	15.94	12.12	76
Belfield	12.90	80	25.63	159	16.08	12.73	79
Dickinson	11.97	76	19.39	123	15.68	7.42	47
Garrison	11.00	67	16.18	99	15.96	5.18	32
Williston	10.38	77	18.74	128	14.66	7.36	50
South Dakota							
Camp Crook	9.90E	71	15.22E	110	13.89	5.32	38
Orman Dam	9.36	62	15.23	101	15.06	5.87	39
Redig	9.59	76	14.71	116	12.67	5.12	40
Wyoming							
Devils Tower	12.51	77	18.38	113	16.31	5.87	36
Colony	9.51	64	20.81E	140	14.90	11.30	76
Rocky Point	-	-	15.47	126	17.21	-	-
Average	10.72	68	18.11	115	15.81	7.51	48
	1954		1953			Variation 1954-1955	
Wibaux 2E	17.69E	114	9.39	60	15.52	8.30	53
Ekalaka	12.64	94	15.73	117	13.39	3.09	23
Beach	17.43	115	12.05	80	15.14	5.38	36
Ryder	18.90	124	16.39	109	15.24	2.51	16
Watford City	16.75	114	16.37	111	15.94	.38	2
Belfield	18.92	118	17.50E	109	16.08	1.42	9
Dickinson	16.33	103	14.65	93	15.68	1.68	11
Garrison	16.14	99	16.33	100	15.96	.19	1
Williston	15.73	107	12.09	82	14.66	3.64	25
Camp Crook	11.05E	80	10.35E	75	13.89	.70	5
Orman Dam	13.25	88	14.26E	95	15.06	1.01	7
Redig	10.65	84	10.30	81	12.67	0.35	3
Devils Tower	12.41	-	23.89E	146	16.31	14.80	91
Colony	10.95E	-	12.17	82	14.90	1.22	8
Rocky Point	10.08	-	16.35E	95	17.61	6.27	36
Average	14.59	96	14.52	96	15.20	3.40	22
	1956		1957			Variation 1956-1957	
Wibaux	9.48	61	16.62	107	15.52	7.14	46
Ekalaka	-	-	14.80	110	13.39	-	-
Beach	9.97	66	17.95	119	15.14	7.98	53
Ryder	17.60	115	12.21	80	15.24	5.39	35
Watford City	14.71	92	15.48	97	15.94	.77	5
Belfield	16.03	100	25.75	160	16.08	9.72	60
Dickinson	12.70	81	22.15	141	15.68	9.45	60
Garrison	14.47	91	12.58	80	15.96	1.89	12
Killdeer	14.38	-	23.19	-	-	8.81	-
Camp Crook	9.56	69	12.06	87	13.89	2.50	18
Orman Dam	11.69	78	14.66	97	15.06	2.97	20
Redig	12.50	99	16.32	129	12.67	3.82	30
Devils Tower	12.87E	79	15.71	96	16.31	2.84	17
Colony	11.47	77	17.62	118	14.90	6.15	41
Rocky Point	12.60	59	17.68	103	17.21	5.08	30
Average	12.86	85	16.99	112	15.21	5.32	35

E - estimated amount. Beach, Ryder and Watford City are within the basin; Belfield, Dickinson, Garrison and Williston are nearly within the basin. Compiled from Climatological Data, Annual Summaries of the tabulated States, for the calendar years 1952-1957; U.S. Department of Commerce, Weather Bureau.

NATURAL RESOURCES

Principal resources of the basin are grazing land and dry farm land. Other natural resources of the area are oil, gas, lignite, bentonite, uranium, clays, shales, and the scenic badlands; the Garrison Reservoir; wildlife and fish. Steep slopes, large areas of badlands, and shallow soil limit use of most of the basin area to grazing. Soil and slope conditions are suitable for farming on a minor portion of the area. Many livestock operators utilize poor sites and small areas for the production of winter feed because no better land is available. Irrigated land is limited to a small area of bottom lands, principally on the main stream of the Little Missouri River.

Rangelands

Badlands along the Little Missouri River are the feature of the rangelands of the area. Along the divides and near the headwaters, the plains are undulating to rolling, becoming steeply rolling as they approach the badlands and the river. Badlands of the Little Missouri River have more vegetal cover than the badlands further south and to the west. This is especially true of the bulk of the badlands which are located in North Dakota where the rainfall is considerably higher than in badland areas further west and further south. While barren slopes and raw rock cliffs and slopes are by no means uncommon in the Little Missouri River badlands, in general they are much better vegetated than other badlands. In addition to the higher precipitation as compared with other badland areas, the North Dakota badlands are less arid with greater precipitation efficiency. These factors promote soil formation as well as growth of vegetation, each of which promotes the other.

Grazing land in the basin is rolling to steeply rolling except for isolated small areas of more level land which usually have poor access. Any considerable area of land suitable for tillage is used for the production of feed crops or wheat. A small part of the 760,850 acres of Land Utilization Project land is former crop farmland which is now utilized as range land. Grass cover predominates on rangelands in the area, particularly in North Dakota. Most of the grass cover is midgrass, with some areas of short grass and on sandy sites some of tall grass. Sagebrush is the principal vegetal type in the southern part of the basin south of Ekalaka, Montana.

Considerable sagebrush grows as far north as the Chicago-Milwaukee tracks at Marmarth. Salt bush is the third type of cover found in this southern part of the basin, following grassland in area. Greasewood, conifer, and juniper cover follow in importance in the southern part of the basin. Deciduous hardwood trees and meadow types are limited to small areas in drainage ways. Waste and barren range types occupy minor areas of rough topography.

Badlands in the southern part of the basin in Montana are largely a severely dissected saline upland with considerable areas of saltbush, greasewood and other saline tolerant plants. In the lower North Dakota badlands grass predominates, not only on the level mesa tops, but also on the slopes and in the bottoms. In that part of the area the ten principal plant species are blue grama grass, blue stem wheatgrass, fringed sagebrush, threadleaf sedge, stony-hills muhly, little blue stem, sideoats grama, green needlegrass, selaginella, and scarlet globe mallow.

The Killdeer Mountains are largely covered with a browse-shrub type of cover which is mostly oak brush and snowberry with some ash and oak of post size along the drainage ways. Further south and out on the plains other common plants are needle and thread and buffalo grasses, big sagebrush, Gardners saltbush, junegrass and prairie sandreed. All of the principal species of plants in all range types found during the field examination of the area and most of the minor plants species are listed in appendix A, "Principal plants growing on rangelands on the Little Missouri River Basin".

Rangelands within the area classification portion were examined and classified by the ecological site method developed by the Soil Conservation Service of the Department of Agriculture. Thirteen range sites were found in the area classification section. These thirteen range sites were utilized in 535 different range site type areas as shown on the Land Classification map. These 535 different formula areas are distributed among a total of 736 separately classified areas as mapped. A classification formula is given on the map for each of these 535 areas. Total number of each of the thirteen sites is as follows: Scabland, 105; clay, 103; clay-shale, 88; shallow, 62; shale, 46; ordinary upland, 45; very shallow, 24; saline upland, 20; sandy, 15; lowland, 9; thin breaks, 7; saline lowland, 6; and badlands, 5. Range site characteristics are given in the Range Site Guide, appendix E. Range sites are the first symbol in the denominator of the area formula as described on the Land Classification Map. The site names are descriptive of the topography, soil character or other principal dominant factor of their potential.

Ten range vegetal types were classified in the area classification portion of the basin. These range types were utilized in the 535 range site type formula areas as shown on the Land Classification Map. Range type designations are described in appendix D. Total number of each range type in the area classification of 915,634 acres is as follows: Sagebrush, 352; grass, 149; saltbush, 12; conifer, 9; greasewood,5; meadow, 2; waste, 2; barren, 2; juniper, 1; and mountain shrub, 1.

Range type vegetal cover by the percentage of each type is shown below for the area classification portion and for the entire basin. Percentiles were determined from the field work on the area classification portion and by field estimations on the entire basin. Nearly all of the sagebrush type contains considerable grass, and much of the land in the basin with sagebrush is marginal between a sagebrush and a grass type.

Range Type	Area Classification Portion 915,634 acres percent	Entire Basin 6,632,160 acres percent
1. Grass	22.00	60.
2. Meadow	.75	
4. Sagebrush	67.00	15.
5. Mountain Shrub	.25	1.
6. Conifer-pine-forest	1.50	1.
8. Barren (and waste)	.50	
10. Decidous trees-woodland		1.
13. Saltbush	5.50	2.
14. Greasewood	.75	
Cropland	1.75	20.

The Land Classification Map shows the following distribution of land ownership and recommended stocking for the part of the basin studied by area classification:

Landownership	Area		Recommended Stocking	
	Acres	Percent	Animal Unit Mos.	Percent
Public Domain	450,223	49.2	71,216	45.4
Land Utilization Proj.	960	.1	160	.1
State Rangeland	46,357	5.1	8,545	5.5
State Cropland	1,195	.1		
Private Rangeland	402,948	44.0	76,792	49.0
Private Cropland	13,951	1.5		
Total	915,634	100.0	156,713	100.0

In the above tabulation, no stocking allowance is given for cropland. If the cropland is used for livestock feed production, or if crop by-products are used for feed, the stocking allowance for cropland may be high. If the 1.6 per cent of the study area which is cropland, 15,146 acres, were used for hay, small grain or silage for livestock feed, total production would be 45,438 animal unit months at a conservative production rate of three animal unit months per acre. This would be 29 per cent of the total recommended stocking for the 900,488 acres of rangeland. Much of the cropland is used for feed production. In case cropland is used for a cash grain crop, there is considerable crop residue of value for livestock feed. Public domain covers 49 per cent of the area which was classified for all types of landownership. This 49 per cent of the area produces 45 per cent of the range forage. Recommended stocking rate on public domain lands averages .158 animal unit months per acre; state lands average .184 animal unit months per acre; and privately owned lands average .191 animal unit months per acre.

Further information regarding each area examined is presented on the Land Classification map with this report. This includes soil characteristics; depth, texture, permeability, and underlying or parent material. Symbols of the three principal plant species making up the vegetal cover are given. The range type is shown by number as listed on the map legend. Range condition as excellent, good, fair, or poor is also in the formula for each separate area on the map. The degree of erosion by sheet type, wind caused and amount of gully erosion are also shown in degrees ranging from 1, slight, to 5, extremely severe,

or nearly complete. The intermediate degrees are 2, moderate; 3, severe; and 4, very severe. The recommended stocking rate is also shown in animal unit months per acre. An animal unit month is the amount of forage required to support a mature cow or steer for one month.

Forest Lands

Timber on public domain land in the basin is largely located in Wyoming. Ponderosa pine makes up most of the stand there. This pine timber is mostly of poor quality, being limby and usually only one or two logs high, seldom more. Some of the best timber is on isolated tracts near the Belle Fourche River Divide in the vicinity of New Haven, Wyoming. Elsewhere in the basin, timber is cottonwood along stream margins with some hardwood growth as trees or thickets in drainageways. Hardwoods are ash, elm and bur oak. They may be associated with boxelder, willow, plum, buffaloberry and choke cherry in some places, or each may grow alone. Cottonwoods and the hardwoods are of value only for posts, poles and fuel. Juniper grows on most of the area in the badlands and in hilly country. It is valuable for posts and has been largely used in the past. The Killdeer Mountains are largely covered with oak and snowberry being browse-shrub type with post size hardwoods along the drainageways. Area covered with timber, names of timber, type of products and valuations of standing timber on public domain in the area are shown in table 6. Custer National Forest land includes 85,935 acres in the basin. Annual timber cut on this land is about 250,000 board feet of Ponderosa Pine lumber. Several small mills in Carter County, Montana, cut this timber and process it into lumber.

Table 6. - Public domain timber area, types and values, Little Missouri River Basin, Montana, North Dakota, South Dakota and Wyoming, 1955

Location State-County	Area Timbered Acres	Timber Types and Values					
		Ponderosa Pine		Juniper	Ash	Total Value Dollars
		Saw Timber MBM	Posts & Poles No.	Posts No.	Posts No.	
Area Classification:						
Wyoming-Crook	2,472	1,280	335,950	300,250		90,658.00
Isolated Tracts						
Wyoming-Crook	1,033	920	123,850	46,250		30,562.00
Wyoming Total:	3,505	2,200	459,800	346,500		121,220.00
North Dakota	260			300	2,000	230.00
Montana - Carter	145	130	67,400			11,150.00
Basin Total	3,910	2,330	527,200	346,800	2,000	132,600.00

North Dakota timber is located in Billings, Dunn, Golden Valley and McKenzie Counties. Standing stumpage valuations used are: saw timber, $8.00 per MBM; Ponderosa pine posts and poles, $.15 each; Juniper and Ash posts, $.10 each.

Compiled from field cruise data, M.R.B., Bureau of Land Management.

Cropland

Irrigated Farm Lands

Irrigation in the area is virtually limited to simple diversions from the Little Missouri or its tributaries onto small areas of hayland. Stream flows are erratic and irrigation utilizes peak or flood flows, usually early in spring and occasionally early in summer, depending upon runoff. Amount of water applied and the area irrigated varies considerably from year to year depending upon the availability of run-off water for irrigation and the need for irrigation to produce hay. The supply of hay available to the affected operators also influences the amount of land irrigated. About 1,000 acres are now being irrigated in the basin. Diversions and ditches have been constructed to cover a much larger acreage. Present and past practice of irrigation in the basin may be classed as flood irrigation of bottom lands adjacent to the diversions.

Several irrigation projects have been proposed for the basin. High costs, small areas of suitable soils, the necessity for water storage, limited water supply and water with salinity and sediment have reduced their feasibility. The 1938 Bureau of Reclamation report by W. C. Sloan, Engineer, states that: "Erratic rainfall and run-off indicate that a safe water supply for any potential Little Missouri irrigation project should include storage capacity sufficient to carry the project over two years at least, and preferably for two and one-half years. " In 1912 the Little Missouri Land and Irrigation Company proposed to develop bottom lands near Alzada, Montana, as a Carey Act Project. In 1914 construction work started on the dam and 9 miles of canal were excavated. A freshet in Cottonwood Creek damaged the dam and washed out 600 feet of the main canal, and no further work was ever done on the project. The Carey Act segregation was cencelled in 1931. A reconnaissance of this Little Missouri Project was made by the Bureau of Reclamation in 1904. Preliminary surveys were made in 1931. This survey proposed an irrigable area of 25,700 acres with a proposed reservoir on Cottonwood Creek and 30 miles of canal. The land to be irrigated was on the west side of the river between the reservoir and Camp Crook, South Dakota. Only 3,000 acres was considered to be suitable for irrigation and costs were considered to be excessive. The State of Montana also investigated this site as a project in 1918.

Dakota Engineering and Construction Company proposed the Roosevelt badlands reclamation project near Medora, North Dakota in 1923. The Reconnaissance Soil Survey of Western South Dakota selected the wide floor and good soils of Valley Creek as the best site for irrigation development in Western South Dakota. That report proposed water storage in the adjacent Pine Hills, but there watersheds are small. Up stream Little Missouri River water might be stored and diverted onto this tributary land.

Bureau of Reclamation proposed Alzada Reservoir Site and Alzada Unit in 1946. The reservoir proposed would lie behind an earth dam in Wyoming, with 60,000 acre feet of live storage, 10,000 acre feet of dead storage and 20,000 acre feet of super storage. Irrigation would be provided for 9,000 acres in Carter County, Montana, near Alzada. No final report has been published. Status of this proposed development in the Bureau of Reclamation program for the Missouri River Basin project in December 1958 scheduled initial construction commencing after fiscal year 1965. Water supply at the dam site varies from 400 to 1,000,000 acre feet annually, so it would be necessary to provide considerable carry-over storage to provide for the years of low flow. The best site or most economical irrigation project in the basin may not have been located.

Little Missouri River Basin is a pioneer area in the development of water spreading. Water spreaders provide for the use of runoff waters on dry range land, and may be regarded as a form of irrigation. Water is "spread" on bottom land near a stream by means of dikes. The water is provided by diversion from a stream with a diversion dam with a canal leading to the dike system. The stream is usually an intermittent draw, but it may be a stream with a small permanent flow which normally is piped through the dam, only flood waters being spread on the land. Cost of producing an animal unit year of forage by this method varies from $60 to $150. This cost compares with purchasing land with an animal unit year cost of forage ranging from $250 to $400. Production of forage on the spreader area is dependent upon runoff in the watershed of the diversion area. Care must be taken to select a site which will benefit by water spreading. Soils heavily impregnated with salts within seepage depth of water applied may concentrate these salts on the surface and destroy the value of the development. Water spreading areas in the basin probably exceed 35,000 acres.

Non-Irrigated Farm Lands

Area of farm land in the basin is about 1,000,000 acres, no definite figure being available as there is no inventory restricted to the area. Most of the area is too rough for tillage. Farm land is restricted to bottom lands and limited bench and high terrace areas along the Little Missouri and its principal tributaries and to the more nearly level plains areas along the exterior divides.

Bottomlands along the Little Missouri are limited, as the valley is quite narrow over most of its length. In Wyoming the valley is largely undulating to rolling. At the Montana-Wyoming state line the valley starts to widen, being 2 to 5 miles wide to Camp Crook, South Dakota. There the valley narrows, being only about three-fourths of a mile wide to Medora, North Dakota. North of Medora the rugged high badlands reduce the valley to one-fourth to three-fourths of a mile in width. At the big bend 45 miles further northward, the river turns eastward and the valley widens to one to two miles in width to the Garrison Reservoir. The valley is sought as headquarters for ranches because of the winter protection that it affords. The valley lands are used to produce winter feed for livestock. Valley bottom and upland cropland are both utilized to produce hay and grain. Native hay, largely bluestem wheatgrass, is the leading type and considerable alfalfa is grown. Small grains produced are wheat, barley and oats. Corn, flax and rye are relatively minor crops. Wheat is the leading crop both in area and value, followed by hay.

The U. S. Geological Survey classified the Northern Great Plains in 1919 and published a report with maps in 1929. Classification for the basin has been compiled from these maps and is presented in table 7. Considering the definitions and limitations outlined in table 7 a number of different totals of farm land could be determined. Farm land might be restricted to the 733,584 acres of farming land, or be supplemented with part, or all of the farming grazing land. If one half of the land in this class is considered to be farm land, the total of farm land is 1,208,905 acres. If all of this class is added to farming land, the area of farm land becomes 1,684,226 acres. All, or any part, of the grazing forage land area might also be added to the farm land. If it be assumed that one-tenth of the years are very good years for production, one-tenth of the area in this class might be included in farm land or 68,134 acres. The total of farm land, based on all of the farming land plus one-half of the farming-grazing land and one-tenth of the grazing forage land is 1,752,360 acres.

Table 7. - Land Classification of the Little Missouri River Basin, Montana, North Dakota, South Dakota and Wyoming, 1929

State and County	Farming Land	Farming Grazing Land	Grazing Forage Land	Grazing Land	Nontillable Grazing Land	Custer National Forest	Land in Garrison Reservoir	Total
Montana								
Carter		185,680	254,700	622,000	409,445	84,015		1,555,840
Fallon	34,700	146,480	41,220	5,100	140,500			368,000
Powder River		1,280			3,200			4,480
Wibaux	93,220	64,820	5,120		77,640			240,800
Montana Total	127,920	398,260	301,040	627,100	630,785	84,015		2,169,120
North Dakota								
Billings	31,820	31,160	26,820		428,280			518,080
Bowman	43,520	86,860	39,400		137,580			307,360
Dunn-Ind. Res.	6,240		10,000		239,440			255,680
Out of Ind. Res.	70,560	2,140	10,720		177,700			261,120
Total-Dunn	76,800	2,140	20,720		417,140			516,800
Golden Valley	231,640	44,400	14,200		323,520			613,760
McKenzie Ind. Reservation	5,184				95,216		2,640	103,040
Out of Ind. Res.	84,940	232,342	43,200	960	681,118		13,760	1,056,320
Total-McKenzie	90,124	232,342	43,200	960	776,334		16,400	1,159,360
Slope	115,120	67,160	29,600		281,560			493,440
North Dakota Total	589,024	464,062	173,940	960	2,364,414		16,400	3,608,800
South Dakota								
Butte				1,920				1,920
Harding		87,040	153,240	8,320	140,360	1,920		390,880
South Dakota Total		87,040	153,240	10,240	140,360	1,920		392,800
Wyoming								
Campbell	3,200	1,280	5,760	6,400	20,480			37,120
Crook	13,440		47,360	183,360	180,160			424,320
Wyoming Total	16,640	1,280	53,120	189,760	200,640			461,440
Basin Area Total	733,584	950,642	681,340	828,060	3,336,199	85,935	16,400	6,632,160

Garrison Reservoir has been made subsequent to the survey . . . . . Explanation of Classes:

Farming land: Tillable land having good soil and located in regions where climatic conditions are suitable for the successful production of small grains.

Farming grazing land: Tillable land located where less favorable soil or climatic conditions prevail, causing crop failures in dry years, thus making the lands principally valuable for a combined use of farming and grazing.

Grazing forage land: Tillable land having poor soil or receiving rather low precipitation, so that grain crops are failures except in good years, thus making the land mainly useful for grazing but with supplemental use for growing forage and for producing grain in very good years.

Grazing land: Tillable land which owing to very poor soil or very low rainfall or a combination of these two factors can not be successfully used for growing tilled crops and is therefore valuable only for grazing.

Compiled from maps including the area: Land Classification of the Northern Great Plains, Cooperation U.S. Department of the Interior, with the U.S. Department of Agriculture, 1929; sheets 1, 2, 5, 6, 7, and 8.

Farm land within the Little Missouri River Basin only, exclusive of the minor Missouri River drainages in the north part of the area, was reported in House Document No. 64, 73rd Congress 1st Session, "Little Missouri River, Wyoming, Montana, South Dakota, and North Dakota," 1933. This Army Engineer's publication gives the area of "cropland and plowable pasture" as 1,363,540 acres within the basin in 1930. The figure given for "area improved in farms" was 955,650 acres in 1920. This report also listed the agricultural production of the basin as acres in the eight principal crops: corn, wheat, oats, rye, barley, flaxseed, hay and forage, and potatoes. Total area in these crops was reported as 226,950 acres in 1910; 500,230 acres in 1920; and 711,100 acres in 1930. This increase in crop production of approximately 225,000 acres each decade probably terminated in 1930 with the drought years and crop areas above 700,000 acres were probably not attained again until after 1943.

Physical suitability of the surface for tillage is the principal, and nearly the sole criterion for the selection of land for farming in this area. Land sufficiently level and in a large enough block to be feasible for use of the operator is nearly always in cultivation. Some sites are eliminated because of heavy soil or salinity, but much land in these categories is utilized for native hay. Some fields and units which are not truly economic for cash crop production are utilized in order to provide feed for the livestock of the operator. In some cases the need for hay or grain, the convenience involved, or the desire to increase income or family labor leads to the use of small or otherwise unsuitable areas. Some fair to good tillable land is utilized for grazing because of preference on the part of the operator.

The amount, efficiency and season of precipitation largely determine the production on farm land in the area. Low rainfall, combined with low prices, made farming unprofitable in the dry thirties. Relief became necessary and there was considerable emigration from the area. At this time 760,850 acres in the area were purchased by the Federal Government for conservation and relief purposes. This Federal land is now in Land Utilization Projects and is called Land Utilization or LU land. This land is leased to livestock operators for grazing purposes on a conservative basis designed to improve the range and to protect the watershed. This purchased land was nearly all grazing land, very little of it having been farmed.

Wildlife

Big game is quite abundant in the area; so much so that it is of considerable economic importance. Ranchers desire to control the number of deer and antelope because of their use of range and hay. Some ranchers also derive income by boarding and guiding hunters. Antelope are the leading big game animal in the basin, followed by mule deer and whitetail deer. Their distribution in the area in 1955 is presented in the following list, which is based on field observation and reports from the Game Department of the several states:

Species	Montana	North Dakota	South Dakota	Wyoming	Total
Antelope	3,500	3,000	500	500	7,500
Mule Deer	1,500	1,000	125	375	3,000
Whitetail Deer	350	325	25	100	800
TOTAL	5,350	4,325	650	975	11,300

Antelope spread all over the area, but usually are more numerous on the plains. Their migrations within the area and between states present a considerable problem in wildlife management. Their management should be coordinated within the area by the four states. Deer concentrate in the river breaks and badlands and also frequent the bottomlands. Twelve elk were planted in the Killdeer Mountains and they are increasing in number.

Fur bearing animals find suitable habitat in the area and have been increasing in number in recent years, largely because trapping has not been advisable. Economic conditions for nearly all of the inhabitants are such that it is not essential that they trap to increase their income; and fur prices have been so low in recent years that it is not attractive to run a trap line in this area. In the past twenty years precipitation conditions have largely favored the water associated fur bearers in the area, including muskrat, mink, racoon, and beaver. Additional habitat for these animals has also been formed by the filling of Garrison Reservoir. Other fur bearers in the area are skunk, bobcat, fox, weasel, badger and coyotes. Bobcats have been increasing in recent years, Coyotes have been effectively controlled in the past but are reported to be increasing recently.

Upland game birds are sufficiently numerous in parts of the area to provide fair hunting during a short season. Ring-neck or Chinese pheasants inhabit cropland areas. Sagehens, Hungarian partridge, ruffed and sharptail grouse are found on the plains and in the badland areas. Some Chuckar partridge have been planted in the basin. Waterfowl are native residents as most of the basin is off the normal flyway. Some migratory waterfowl pass through the northern part of the basin. Filling of Garrison Reservoir may increase use of the area by migratory waterfowl. Native waterfowl inhabit ponds, waterholes and live streams. They include mallards, coots and teals. These native birds also have additional area with the filling of Garrison Reservoir and will probably increase in number.

Sport fishery will probably develop in Garrison Reservoir, which has a large shore line. Fish in the area were largely limited to reservoirs and ponds which have been stocked with small mouth bass, bluegill, crappie and some channel cat. The Missouri River and the Little Missouri River and their principal tributaries also afford some fishing.

Minerals

The mineral resources of present economic importance in the Little Missouri River Basin include lignite, oil, gas, bentonite, scoria, sand, gravel and possibly uranium, particularly uraniferous lignite deposits. The relation of the mineral resources to management and disposal activities on the public domain within this area can be correlated best on the basis of whether they are locatable or leasable minerals.

Locatable Minerals

That portion of the Little Missouri River Basin most likely to be subject to mineral locations in the southern end, including the southeast corner of Montana from and including the Ollie-Carlyle area and Ekalaka Hills south; the western part of Harding County, South Dakota and Crook County, Wyoming. High swelling bentonite deposits occur at the bottom and top of the Mowry shale and the lower part of the Belle Fourche shale, upper shale members of the Graneros formation of upper Cretaceous Age. As many of the bentonite deposits in the Black Hills area of South Dakota are becoming depleted, production in Wyoming and the Alzada, Montana districts is increasing. Therefore, mineral location activities may be expected in areas where the Mowry and Belle Fourche members of the Graneros formation outcrop at the surface or are known to be close to the surface. Such areas roughly parallel the river course on both sides.

In the Ollie-Carlyle district of Fallon and Wibaux Counties, Montana, uranium mineralization has been found in the Toungue River member of the tertiary Fort Union formation. The uranium occurs primarily as carnotite in carbonaceous trash lenses and beds within the lower half of a fine-grained sandstone bed about 90 feet thick. In North Dakota along the eastern edge of the basin in Billings County, uraniferous lignite deposits occur in the Fort Union formation which warrant economic consideration upon the final solution of existing benefication problems. These deposits are located in the north and south Belfield areas in T. 140 N., Rs. 99 and 100 W. and in the Rocky Ridge area, T. 137N., R. 100W. The Rocky Ridge area laps over into northern Slope County. No public domain remains in those parts of the basin described above; however, since the Fort Union formation underlies a major portion of the basin as a whole, it can be anticipated that upon solution of the beneficiation problems considerable exploration of the lignites is bound to develop. On the scattered parcels of public domain and on land where the coal is reserved by the United States location activity should be expected. On acquired lands where the United States owns the minerals, applications for leases may be expected, and all cases will require a careful land status check.

In the Ekalaka and Long Pine Hills areas of Montana sub-ore grade uranium mineralization has been found in the Hell Creek formation, the Ludlow member of the Fort Union formation, and the Arikaree formation. Further to the southeast radioactivity has been reported in the Short Pine Hills area in the southwest corner of Harding County, South Dakota. Other areas of uranium mineralization have been found in South Dakota in significant proximity to the Little Missouri Basin. In the Belle Fourche Basin, Butte County, the A. E. C. found uranium ore in the Lakota formation at 200 feet depth in the nose of the Aladin anticline and concentrations up to 0.15% showings were found in the Dakota formation. Also some commercial ore has been found in the Cave Hills and Slim Buttes areas of Harding County. In Crook County, Wyoming, the Homestake Mining Co. is producing primary uranium ore from near the base of the Lakota formation at a depth of about 300 feet. Original production was of oxidized ores (carnotite) from the Dakota formation by open pit mining while the present production is by underground methods. All areas in the vicinity of the Ollie-Carlyle, Ekalaka - Long Pine Hills, Short Pines Hills and others having similar stratigraphic sequence should be considered as probable conflict areas as a result of uranium staking activities. Also all areas in the basin underlain by the Fort Union formation will likely be conflict areas where involving public domain or private lands in which the coal is reserved to the United States. On Acquired lands the uranium can only be obtained through leasing from the Government.

Sand and gravel have been produced commercially in Golden Valley and McKenzie counties, North Dakota, and in Crook and Campbell counties, Wyoming. Now sand and gravel are classified as common variety mineral materials under Section 1 of Public Law 167, Act of July 23, 1955, 84th Congress, and may now only be disposed of under the provisions of the Disposal of Materials Act of July 31, 1947. There may be some claims located for sand and gravel prior to the passage of Public Law 167 which would have to be considered in any disposal program either for lands or for sand and gravel by applications by states and counties for right-of-way or application for sales.

Leaseable Minerals

Lignite production in general has been decreasing for some time due to the increasing availability and use of oil and gas. In the Little Missouri River Basin the only recorded production of lignite was in Golden Valley and McKenzie Counties of North Dakota. According to the Coal Mine Inspection Department of the State of North Dakota for 1957, only one mine operated in Golden Valley County, producing a total of 1,817 tons, making the total production for the basin 2,117 tons of lignite, an insignificant production.

At the present time, oil and gas are by far the most important of the minerals in this basin. During 1957, 91 new wells were completed, including 73 oil producers, 2 oil and gas producers, 2gas producers and 14 dry holes.

Drilling activity by states in 1957 was as follows:

State and County	Oil	Oil & Gas	Gas	Dry Holes
Montana, Fallon	1		2	1
North Dakota, McKenzie	72	2		9
South Dakota, Harding				1
Wyoming, Crook				3
Total	73	2	2	14

The comparative importance of the leasable minerals in the Little Missouri River Basin is shown by the receipts of the Bureau of Land Management from royalties and rentals under the Mineral Leasing Acts. The receipts include rental and production income from public domain minerals and minerals in acquired lands.

The following table, computed to include approximately only those lands of each county within the Little Missouri Basin, shows the receipts by counties for the calendar year 1957:

State & County	Producing Oil & Gas Royalties (dollars)	Non-Producing Oil & Gas Rentals (dollars)	Coal & Other (dollars)	Totals (dollars)
Montana:				
Carter	7,773.69	86,663.25	-	94,436.94
Fallon	202,871.82	18,901.05	-	221,772.87
Powder River	-	155.00	-	155.00
Wibaux	115,226.76	1,532.04	-	116,758.80
Totals	325,872.27	107,251.34	-	433,123.61
North Dakota:				
Billings	-	15,513.50	-	15,513.50
Bowman	3,512.06	11,343.30	-	14,855.36
Dunn	-	6,633.15	-	6,633.15
Golden Valley	-	9,480.00	-	9,480.00
McKenzie	34,015.32	39,728.40	125.29	73,869.01
Slope	-	7,968.00	-	7,968.00
Totals	37,527.38	90,666.35	125.29	128,319.02
South Dakota:				
Butte	-	25.00	-	25.00
Harding	-	17,480.00	-	17,480.00
Totals	-	17,505.00	-	17,505.00
Wyoming:				
Campbell	890.00	4,360.50	-	5,250.50
Crook	1,170.00	28,265.00	-	29,435.00
Totals	2,060.00	32,625.50	-	34,685.50
Basin Totals	365,459.65	248,048.19	125.29	613,633.13

Disposal and management activities within the basin are not likely to be materially affected by mineral development with the possible exception of minor conflicts resulting from the location of bentonite and uranium claims. Minor demands may be expected for sand, gravel and scoria. Due to adequate classification for the leaseable minerals by the United States Geological Survey, no foreseeable land use or disposal problems are indicated.

Water

Little Missouri River and its principal tributaries have highly erratic flows. Flows during freezing weather and in protracted droughts are so low that the streams are barely permanent streams. Total annual discharges also vary greatly. Variability in annual flow of both the tributaries and of the main stream is so great that any irrigation development should provide at least 2 years of carry-over storage in order to provide irrigation water for the years of low supply. In addition to these erratic flows with years of low supply, the average annual flow at several possible sites of irrigation development is too low for the area available. Further downstream where more water would be available, good sites for development are lacking.

Little Missouri River drainage is virtually lacking in any high run-off area which would produce a large volume of dependable flow. There are no high mountains with large volume precipitation accompanied by timber cover to stabilize flow over the years, such as supply the Yellowstone River and much of the upper Missouri River watershed. Vegetal cover, slope and soil characteristics on much of the watershed favor rapid run-off of the sudden heavy storms which furnish much of the precipitation. In most winters snow collects on frozen ground so that the snow melt largely runs off in spring with little penetration and with little water storage in the soil.

Stream flow measurements made by the Geological Survey are available for six gaging stations in the basin, four on the Little Missouri River and two on tributary streams. Gaging stations are located on Beaver Creek and Little Beaver Creek. Maximum and minimum flows and the annual flow characteristics for each of these gaging stations are shown in table 8. This tabulation clearly shows the great variation in run-off.

In addition to variable flows, another unfavorable feature of the water supply is that the Little Missouri carries a large volume of sediment. This sediment is largely from the badland and near badland areas which occupy much of the basin. In House Document number 64, 73rd Congress, 1st Session, the Corps of Engineers estimates the average annual sediment discharge of the Little Missouri River to be 8,600,000 tons. They also estimate that the proposed Cottonwood Creek Reservoir would fill with sediment in 41 years. Estimated duration of the Bullion Butte Reservoir was 58 to 61 years until filling with sediment would be complete. Bureau of Reclamation does not anticipate such rapid sedimentation at the proposed reservoir site near Alzada. In their study published March 28, 1946 at Billings, Montana, they propose only 10,000 acre feet for sediment in the capacity of the reservoir, with 60,000 acre feet of live storage and 20,000 acre feet of super storage. This study states that the stream is a very heavy sediment carrier for its size.

Another unfavorable factor of the Little Missouri water is its high salt content. This is largely caused by the high salinity of soils in much of the badlands area. Samples were taken at several sites over a number of years by the Geological Survey in order to determine the chemical quality of Little Missouri water. Results of these studies were published as Chemical Analyses of Surface Waters in the Little Missouri River Basin, 1945 to 1949, United States Geological Survey. There are subsequent supplements to this study.

Water samples taken at Alzada, Marmarth and Medora showed a range of averages of 715 to 1,208 parts per million of dissolved solids. These averages were compiled from analyses of several sets of samples taken at different times. Range in amount of dissolved solids among individual samples was from 138 to 2,190 parts per million. Per cent of sodium varied from 50 to 64 in the averages of the sets of samples. Amount of sodium in the dissolved solids varied from 10 to 88 per cent in the individual samples. Salinity of water of the Little Missouri is sufficiently high that its quality for irrigation may be subject to question for some soils and for some crops. Despite salinity, sediment and variable flows, it is probable that irrigation development in the area with storage may be justifiable in the future. Such development would be based on a new level of economy and multiple uses for irrigation, sanitation, flow stabilization, sediment control, flood control and recreation.

Table 8. - Stream flows, Little Missouri River Basin, Montana, North Dakota, South Dakota and Wyoming; record years to 1954

Stream	Drainage Area Sq. Mi.	Max. Flow CFS	Min. Flow CFS	Annual Flows - Acre Feet					
				Average	Maximum	Water Yr. Oct 1 - Sept 30	Minimum	Water Yr. Oct 1 - Sept 30	Record Period Yrs.
Little Mo. River 17½ mi. S. of Watford City, North Dakota	8,490	110,000	0	467,000	968,300	1943-44	192,900	1934-35	20
Near U.S. 10, Medora, North Dakota	6,190	65,000	0	372,100	958,650	1928-29	85,870	1930-31	12
Marmarth, North Dakota	4,570	45,000	0	280,900	657,370	1943-44	64,010	1953-54	16
Alzada, Montana	780	6,000	0	58,860	235,200	1943-44	3,480	1930-31	26
Little Beaver Creek 3 mi. SW of Marmarth, N. Dakota	615	12,700	0	31,900	85,740	1951-52	10,910	1953-54	16
Beaver Creek Highway 10 at Wibaux, Mont.	311	3,780	0	19,760	42,450	1948-49	1,360	1940-41	16

Stream flows in recent years have been reduced by numerous retention reservoirs for livestock water on minor tributaries and a considerable number of diversions for irrigation and water spreading. USGS Water Supply Paper #1339, Surface Water Supply of Missouri River Basin above Sioux City, Iowa, 1954, published 1956. Other Water Supply Papers for the area 1939-1956.

Development of irrigation, water use, water conservation and storage in the basin are complicated by the location of the basin within four states. In 1959 a water compact for the river is being studied by the four states. Wyoming apparently produces water of the highest quality and has some good dam sites for water storage, but seems to lack good irrigation development sites with sufficient area. The proposed Alzada development of the Bureau of Reclamation would utilize water stored in Wyoming at Alzada Reservoir site to irrigate 9,000 acres of land in Montana on the Alzada Unit. Good sites for irrigation development may also be located in North Dakota and South Dakota, but an ample water supply and good feasible reservoir sites are a problem for most of the sites with suitable land. Downstream from Wyoming, salinity of the water in the river usually increases, especially after the river receives runoff from badlands areas.

Bureau of Reclamation considers the Alzada Unit and Alzada reservoir site to be the only feasible irrigation development according to their investigations as published in 1946. Alzada Dam is planned to be an earth fill structure 5,500 feet long with a crest of 62 feet. Total diversion is estimated at three acre feet per acre of irrigated land. Irrigation use of stored water should probably be by canal from the storage, as proposed in the Alzada development, as water loss in the channel to a lower diversion might be excessive at the time it became necessary to utilize the stored water for irrigation. Salinity might also be increased in the irrigation water because of the accumulation of salts in the river channel as flow receded prior to the release of storage water.

Stream flows in the basin are erratic, so water storage and conservation are valuable objectives. Control of sediment production to reduce the amount of sediment entering Garrison Reservoir is also important. Development of irrigated land within the basin would be of value to help stabilize the livestock industry, which is the major enterprise and the major land use in the basin. Irrigation development in the area would also promote conservation of range land in the area. At present the basin is dependent upon the widely fluctuating yields of dry farmed local feed crops, yields from very limited local irrigation and water spreading areas and supplements imported from other areas to provide livestock feed for shortage periods. It is important to the progress and welfare of the basin and to their respective commonwealths that the four states within the basin reach a water compact which will permit the proper conservation use and maximum feasible development of the water in the basin at the most effecient sites.

HISTORY OF RESOURCE USE

Exploration

Verendrye (Pierre Gautier de Varennes), a French explorer searching for a route to the Pacific, and his party were probably the first white men to view the area in 1738. Two of Verendrye's sons explored further in 1740 - 1742. They crossed the Missouri near Sanish and went southwest, looking for a site for their father's dream, a trade route to the Pacific. Had they followed the Missouri they might have found it. Instead the Little Missouri led them to the Bighorn Mountains, where they gave up the quest and returned to recross the Missouri. Trappers and traders soon followed the explorers. When Lewis and Clark ascended the Missouri in 1804, they found the English-Canadian trading post of Fort Mandan at the Five Villages at the mouth of the Knife River, and stopped to winter there, leaving early in 1805. They went up the Missouri along the north boundary of the area. Clark returned eastward down the Yellowstone River, just west of the area, in 1806.

The Fur Trade

The Little Missouri River Basin has long been a boundary region. In the Indian days it demarked the hunting grounds of the Crow and Blackfeet on the west, from the Sioux on the east and the Assiniboin and Gros Ventre on the north. The Missouri River was a travel and trade route with agricultural earth lodge villages of the Mandans, Hidatsa and Arikara Indian tribes just eastward of the area. Indian troubles were brought on by the buffalo hide hunters in 1850 - 1870. The Minnesota outbreak of 1862 induced military reprisal campaigns by Generals Henry Sibley and Alfred Sully. Battles were fought in the area known as "The Battle of the Badlands"and"The Battle of Killdeer Mountain". These campaigns drove the hostile Dakotas to"the badlands west of the Missouri". Later, settlers came as far west as the badlands and stopped.

First use of the area by white men was for fur trading with the Indians. This was almost the sole use of the area for over a century, 1760-1875. First trading post drawing furs from the area was established at Fort Mandan about 1790. Here were the Five Villages of the Hidatsa and Mandan Indians, offering an established trade and population center at the mouth of the Knife River on the Missouri, 40 miles east of the area and 66 miles down river from the mouth of the Little Missouri. Both Hudson's Bay Company and the North West Company used this outpost. In the early days, during the English-Canadian use of the area

prior to 1812, connection to the area and the Missouri was largely overland to the Great Lakes, thence to Quebec, and later, to Montreal. For many years Fort Mandan was the last outpost both westward and up the Missouri River. Later trading and military forts serving the area were FortsYates, Clark, Lincoln, William, Montimer, Berthold, Henry, Buford and the largest of all; Fort Union. All of these forts were located on the Missouri. Only fort in the area was Fort Dilts, near Marmarth. This was a sod earthworks constructed during an Indian battle.

Trading on the Missouri had gradually progressed upstream from St. Louis after 1790. After Lewis and Clark explored the Missouri route in 1804, a St. Louis fur trader, Manuel Lissa, followed to establish a post on the Yellowstone River west of the area in 1807. American Fur Company built Fort Clark near the mouth of the Knife River in 1826 and Fort Union at the mouth of the Yellowstone in 1831. They commenced operation of steamboats in 1831 to supply their forts and to bring furs to St. Louis.

Steamboating on the Missouri was highly profitable in the early days, rising to a peak in 1858. A single voyage to Fort Benton, Montana, often paid for the boat by earning $40,000. Passage was $300 cabin, $75 deck with 10-15 cents per pound for freight. In 1867, 31 boats made the trip to Fort Benton. War between the Assiniboins and Blackfeet in 1831 threatened extinction of the upriver fur trade. Kenneth MacKensie, Director of the Upper Missouri outfit of the American Fur Company brought the hostile chiefs together at Fort Union to make medicine and to establish peace between the two tribes in order to promote trade. Peace was established under MacKensie's Treaty of 1831. From statesmanship MacKensie went to distilling, setting up a distillery at Fort Union to make the essential fluid of the fur trade among the Indians. The Government frowned upon this activity so near the point of consumption in Indian territory, so the plant was soon shut down. The doom of the river steamer was sounded in 1871 when a survey party for the Northern Pacific Railroad started from Fort Rice on the Missouri, ten miles north of the mouth of the Cannonball River. Pausing briefly at Bismarck, the railroad soon crossed the Missouri and built westward into the area in 1880.

Cattlemen, the First Settlers

Actual settlement first by-passed the area, going along the Missouri and up the Yellowstone west of the area along the old river and steamboat routes. Cattlemen were first attracted to the area by the protection from storms afforded by the badlands. With the confinement of the Indians to reservations in 1877, cattlemen began to build headquarters in the Little Missouri bottom-lands.

In other sections of the west, crops, settlements or railroad building made early history. In the Little Missouri, two men stand out as the historic base:President Theodore Roosevelt and the Marquis de Mores. Both came to the basin in 1883. Roosevelt bought the Chimney Butte Ranch and returned east. The Marquis stayed and spent a fortune to develop the area. He built a huge packing plant at Medora, expending one-quarter of a million dollars. He developed a refrigerator car line with icing stations to ship western beef and Puget Sound salmon to eastern markets.

A third venture of the Marquis de Mores was a stage line from Medora to Deadwood-running time 36 hours, fare $21.50 for the 215 miles. There were 15 stations, four coaches, 150 horses and the road in the venture. Failure to secure the mail contract doomed this venture to one year. All of the Marquis' ventures ended in failure. He acquired a large area of land in the area and lived as a European nobleman in the countryside. His 28 room mansion stands today as a museum at Medora. The packing plant burned in 1907 and only the brick smoke stacks stand today, monuments to a quarter million dollar poorly planned venture. The Marquis built the town of Medora, named for his American wife, on the east bank of the Little Missouri along the Northern Pacific tracks. He established a huge general store with a large and varied line.

Theodore Roosevelt returned to the badlands of the Little Missouri after the sudden simultaneous deaths of his wife and mother in 1885. Selecting a site 35 miles north of Medora in a grove of cottonwoods in the Little Missouri bottom, " T.R. " built a spacious cabin of handhewn cottonwood logs. Finding a pair of locked elkhorns in the grove, he named his ranch the Elkhorn. He became the proprietor of three cattle brands, the Maltese cross, the triangle and the Elkhorn.

Coming to the west to rest from his political career, Theodore Roosevelt actually established the foundation that led him to the presidency. Here he made friendships and led the stockmen who in turn

became his"Rough Riders" of San Juan Hill fame and who secured the Vice Presidential nomination for him. Here he acquired the physique, horsemanship and endurance that made him a military leader. Here he learned of the needs and problems of the new west; here his deep interest in conservation and western expansion was born. Here he acquired vision and a sense of action in accord with need from the west, from hunting and from running cattle. Here he formulated the spirit and judgement that led the nation through a critical internal development period and led the world toward a new concept of international relations. Hunting, the round up, riding the range, organizing the stockmen, and law enforcement occupied his days. Evenings were spent reading and writing. Here he wrote "Hunting Trips of a Ranchman" (1889) and "Ranch Life and the Hunting Trail" (1888). Indirectly, the Little Missouri also probably accounts for a second President. Owing to the inspiration and guidance of his illustrious uncle, another Roosevelt, Franklin Delano, became interested in the national political forum. Theodore Roosevelt likewise inspired Eleanor Roosevelt, another relative, who became an active figure on the national and international scenes, both as the President's wife and in her own right.

Today Theodore Roosevelt is commemorated by the National Park in the area bearing his name, and by the gigantic stone carving of which he is a part, on Rushmore National Memorial in the nearby Black Hills of South Dakota. He did much to build the nation and to enhance our national prestige at the time when we were developing the west, entering the mechanical age, and emerging as a world power. Definite and outspoken, he pursued a course with a strong Army and Navy and wielded " a big stick" which has long been his symbol and tradition. Many events and periods have occurred since which have called for one with his spirit, vision, and action. Many an American has yearned for one who would pursue his course.

When Roosevelt and the Marquis de Mores came to the Little Missouri in 1883, they found an open land teeming with game, Elk, deer, and antelope were abundant and it was not difficult to find bear, cougar, buffalo and mountain sheep. Cattle grazed the open range and were handled by means of the round-up and the range rider. Pioneers, ranchers, cowboys, hunters and railroaders mingled in the towns and settlements in and near the area. Land was unsurveyed.

Surveys and Homesteading

Early settlement for homesteading and farming by-passed the area for more attractive sites further west and to the east. Cadastral surveys are indicative of settlement and homesteading. Earliest surveys in the area were near Wibaux in 1882 and 1883. Some townships in Wyoming near the headwaters were surveyed in 1883. Surveys in the Montana part of the area were made in 1882 to 1954, the largest number of townships being 20 in 1909. In the North Dakota portion surveys were made in 1884 to 1914, largest number of townships surveyed being 41 in 1905 with 32 in 1900 and 26 in 1907. South Dakota surveys in the area were made from 1891 to 1895, the largest number being 12, more than one-half, in 1895. Wyoming surveys extend from 1883 to 1921. The original surveys in the Wyoming part of the area were in 1883; all other surveys there were resurveys during 1914 - 1921, the largest number of townships surveyed being 13 in 1916.

Cadastral surveys in the area by date and number of townships surveyed are shown in table 9. Data is given for each County and for each State in the area for 8 years, 10 pairs of years and 4 groups of years for the period 1882 to 1954. The groups are periods of 3 and 4 years. Large numbers of townships surveyed within the basin were made in these years: 1905, 45; 1900, 33; 1907, 26; and 1903 and 1909, 21 for each year. On a percentile basis for the area, 13 per cent of the townships were surveyed in 1905; 9 per cent in 1900, 7 per cent in 1907; and 6 per cent in each, 1902, 1903 and 1909. Cadastral rectangular surveys in the area for four periods are shown on a map of the basin in figure 2. The four periods are 1882 to 1908, stone monuments or wooden stakes; 1908-1911, stone or steel pipe brass capped monuments; 1912 to 1958, steel pipe brass capped monuments, and the river bottom resurvey of 1945 for the Missouri River Basin Program with brass capped steel pipe monuments.

Largest amount of recent resurveys, monumented with steel posts and brass caps subsequent to 1909, were made in 1917 when 17 townships were resurveyed, or five per cent of the total. Fifteen townships, four per cent, were resurveyed in 1911; fourteen, or four per cent, in 1916; twelve, or three per cent, in 1915; and 11 or three per cent, in 1917. The original internal survey of the Fort Berthold Indian Reservation was made with brass caps in 1911 and 1914 within the basin. Total area monumented with brass cap steel posts in the area is 118 townships or 33 per cent of the basin. Rock or wooden monuments cover 238 townships, 67 per cent of the basin. These 238 townships are divided as follows:

Table 9. - Dates of most recent cadastral surveys by number of townships or partial townships for each period 1882 - 1958, by counties in the Little Missouri River Basin, Montana, North Dakota, South Dakota, and Wyoming, 1958

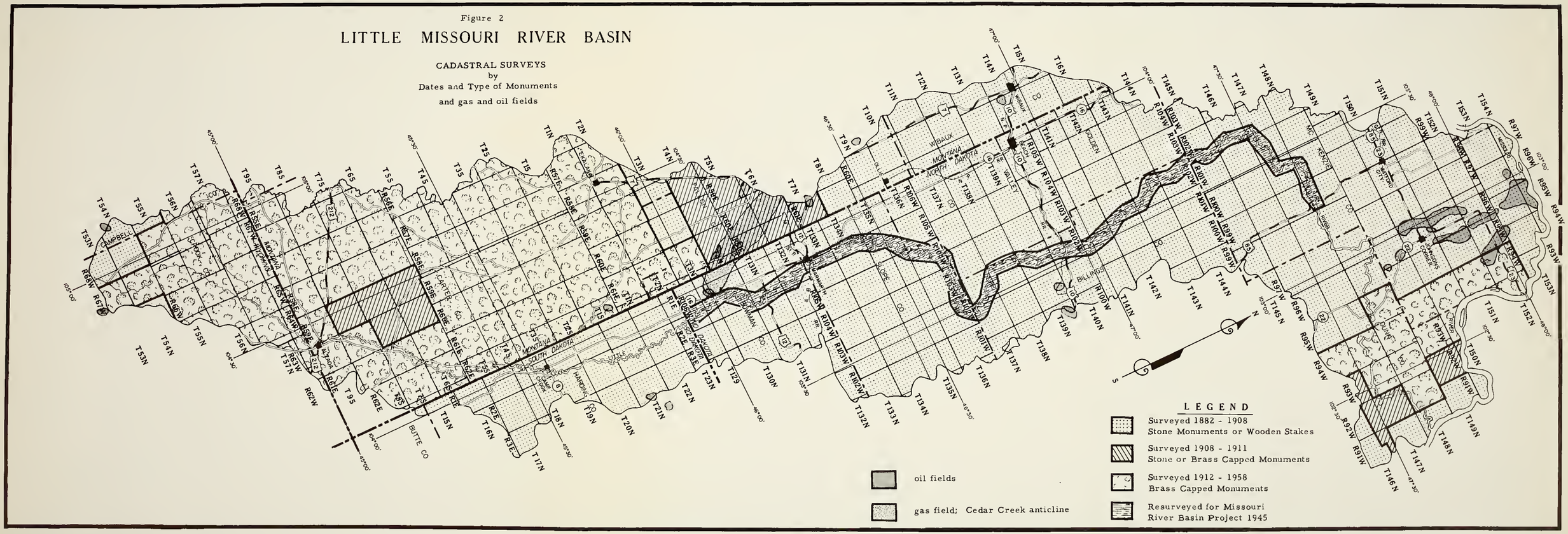
Period of Survey	Carter	Fallon	Powder River	Wibaux	Montana Total	Billings	Bowman	Dunn	Golden Valley	McKenzie	Slope	N. Dak. Total	Butte	Harding	S. Dak. Total	Campbell	Crook	Wyo. Total	Area Total
1882-85				5	5	3						3				3		3	11
1890-93	2				2			2				2		7	7				11
1894-95													1	16	17				17
1896-97	6	1			7					11		11							18
1900	1				1	4		7	9	12		32							33
1901-02	2	1			3				8	11	4	23							26
1903-04	1	2		4	7	2	16		2	1		21							28
1905-06		4		2	6	17			6		18	41							47
1907						2		6		18		26							26
1908-09	11	9		1	21														21
1910-11	11		1		12			5				5							17
1912-13	5				5														5
1914-15	13	7			20			7				7					2	2	29
1916-17	7				7											2	16	18	25
1918-21	3				3											1	6	7	10
1922-24	10				10														10
1932	2				2														2
1939	2				2														2
1945	6				6														6
1948	4				4														4
1952	7				7														7
1954	1				1														11
Total	94	24	1	12	131	28	16	27	25	53	22	171	1	23	24	6	24	30	356

Other cadastral surveys in the area were: Theodore Roosevelt National Memorial Park Boundary, 1956; Bottom lands of the Little Missouri River, Alzada, Montana, to Medora, North Dakota, 1948. Compiled from Land Office Cadastral Survey Records, Bureau of Land Management, 1958. Survey dates are indicative of demand on the part of locators or settlers prior to 1930. Subsequent to 1930 surveys indicate demand by lessors, or by investigational or administrative agencies. The largest number of townships surveyed in one year were surveyed in 1905 when 45 townships were surveyed in the area.

Figure 2

LITTLE MISSOURI RIVER BASIN

CADASTRAL SURVEYS
by
Dates and Type of Monuments
and gas and oil fields



57, or 16 per cent prior to 1900; 181, or 51 per cent, 1900 to 1909. These monuments, or traces of them can generally be found in grassland areas because the accompanying pits are distinguishable in the sod. In farming areas or open sites these old monuments have often been destroyed or have been lost by decay.

Most of the area was utilized by cattlemen prior to 1900. Actual settlement for homesteading began after 1900, being most active during the years 1904 - 1910. Settlement was about five years later in Carter County, Montana, and most of the settlement in Wyoming was in the period 1916 - 1927. Most of the homesteaders came from the eastern part of the Dakotas and Minnesota. Others came from Wisconsin, Iowa and Nebraska. Many were foreign born who stayed briefly further east after immigrating from northern Europe. Nearly all came to raise grain. Flax was a common crop for the first several years after breaking.

Development in farmland use of the area from settlement days, 1910 until 1925, is shown in table 10. Total area farmed to cereals, hay, forage and potatoes increased from 228,040 acres in 1910 to 711,190 acres in 1925. Settlement and development of the area was virtually completed in 1925 as far as farmland was concerned. Livestock production and valuations in the area in 1910, 1920 and 1925 are shown in table 11. Total animal units increased from 169,882 in 1910 to 203,551 in 1925. Valuations were greatest in 1920 when horses were still valuable and all livestock were high priced, the total being $11,150,390. The increase in livestock reflects more intensive use of the range resource and increased use of supplementary feeds produced on farm land.

Increase in production and value of livestock products in the Little Missouri River basin during the same years is shown in the following tabulation:

	1910	1920	1925
Value of milk, cream & butter	$ 56,630	$ 712,180	$ 635,110
Value of eggs and chickens	79,220	407,880	358,170
Value of wool	289,940	334,960	393,970
All livestock products	425,790	1,455,020	1,387,250

Combined values of crops produced and livestock products sold in 1925 was $11,582,720 from the 6,080,000 acre area of the Little Missouri River basin. Total value of crops, livestock products and livestock sold in 1925 was $ 18,225,580, according to data from House Document No. 64 of the 73rd Congress, 1st Session, 1933.

Table 10.- Area, production and value of crops in the Little Missouri River Basin; Montana, North Dakota, South Dakota and Wyoming; 1910, 1920 and 1925

	Area, Acres			Production			Value Dollars
	1910	1920	1925	1910	1920	1925	1925
Barley	4,140	4,710	19,330	113,870 bu.	21,130 bu.	424,520 bu.	268,030
Corn	3,850	1,830	9,390	96,840 bu.	12,330 bu.	130,790 bu.	121,170
Flaxseed	37,270	9,000	70,690	487,940 bu.	18,220 bu.	459,160 bu.	1,115,310
Hay & Forage	79,890	216,460	190,350	70,170 tons	75,560 tons	167,110 tons	1,492,510
Oats	48,450	18,380	84,670	1,837,850 bu.	102,040 bu.	2,275,670 bu.	829,040
Potatoes	1,250	1,960	1,340	138,640 bu.	51,610 bu.	107,940 bu.	109,760
Rye	130	25,830	23,000	2,190 bu.	69,810	286,410 bu.	261,070
Wheat	53,060	222,060	312,420	1,027,340 bu.	589,100 bu.	4,211,550 bu.	5,998,580
Total	228,040	500,230	711,190	3,704,670 bu. 70,170 tons	864,240 bu. 75,560 tons	7,896,040 bu. 167,110 tons	10,195,470

For the Little Missouri River Basin area of 6,080,000 acres. Compiled from House Document No. 64, 73rd Congress, 1st Session: Little Missouri River, Wyoming, Montana, South Dakota, and North Dakota. Letter from the Secretary of War. U.S.G.P.O., Washington, 1933.

Table 11 - Production and value of livestock in the Little Missouri River Basin; Montana, North Dakota, South Dakota and Wyoming; 1910, 1920 and 1925

	Number			Sales Value, Dollars		
	1910	1920	1925	1910	1920	1925
Cattle	82,000	105,610	115,340	$2,444,480	$6,184,020	$3,113,410
Horses	35,530	50,590	52,330	3,409,060	3,567,630	1,730,010
Mules	190	360	620	25,310	31,460	28,530
Sheep	253,460	81,360	135,480	1,295,630	1,133,230	1,402,180
Swine	5,880	14,200	32,660	59,960	234,050	368,730
Total Animal Units	169,882	176,382	203,551	$7,234,440	$11,150,390	$6,642,860

Sheep are one-fifth animal unit; swine are one-fourth animal unit; other livestock are one animal unit.

Compiled from House Document No. 64, 73rd Congress, 1st Session: Little Missouri River, Wyoming, Montana, South Dakota, and North Dakota. Letter from the Secretary of War. U.S.G.P.O., Washington, 1933. For the Little Missouri River Basin area of 6,080,000 acres.

Development of Oil and Gas

Considering the early recognition of the Cedar Creek anticline and present volume production of oil in the area, it seems strange that oil discovery was delayed until 1952. Contributing causes are depth and development difficulties which largely precluded earlier development. Oil occurs here at depths below 6,000 feet, with nearly all commercial production from below 8,000 feet. Gas was developed in the Cedar Creek field in the area in 1910. In 1936 the gas field operator, Montana-Dakota Utilities discovered oil on the south end of the Cedar Creek anticline near the present Little Beaver Creek field. They drilled 3 wells below 8,000 feet, but were unable to develop commercial production. Carter Oil Co. tried in 1941, but abandoned a non-commercial well. Husky Oil Co. drilled in 1949 to abandon a 10 barrel per day well.

Development of the northeast Wyoming fields in 1900-1920 brought production near the southern end of the basin. Moorcroft field extends to the southern divide of the basin. Recent new discoveries and developments in northeastern Wyoming, notably in the Donkey Creek field just south of the basin, have stimulated interest and development in that area and in all of the Powder River geologic area. This interest resulted in the discovery of Bertha field in the basin in Campbell County, Wyoming in 1954.

Amerada Petroleum Co. discovered the Beaver Lodge and Tioga fields in North Dakota Williston Basin exploration in 1951. Extending southward, they discovered the Charlson field just south of the Missouri River in the area in 1952. Exploration and development followed swiftly with West Sanish, Keene, Blue Buttes and Croff fields in McKenzie County. Wibaux field was developed in Montana. Fryburg and Rocky Ridge fields were developed on the eastern divide in Billings County. Two fields were found on the Cedar Creek anticline within the basin, Little Beaver and East Little Beaver in Fallon County, Montana. Just north is Fertile Prairie field and twenty miles south Repeat field was discovered in Carter County.

In 1957, four new oil discoveries were made in McKenzie County near West Sanish field, south of Blue Butte field and south of Croff field at Bear Den. New discoveries were made at Rocky Ridge in Billings County, Exploration accelerated in 1958 with seven new discoveries in McKenzie County at Sand Creek, Keene, Clear Creek, Dimmick Lake, Blue Buttes, North Fork and Pershing. A discovery was made at Scoria in Billings County and at the southern tip of the Cedar Creek anticline in Bowman County, called Little Missouri field. Another new discovery extended the Buffalo field into the basin in Harding County, South Dakota.

Exploration and development are continuing. Location of oil fields within the basin area is shown in figure 2. The Little Missouri Basin area may soon become a major oil producing area. Unfortunately, the area is a part of the general Rocky Mountain region where oil is in surplus supply and most of the production must be shipped or piped long distances to markets. From a geological standpoint, the basin is considered as parts of the Powder River and Williston Basins, so the area loses its identity in professional oil circles.

AREA ECONOMY

Most people in the Little Missouri Basin make a living by grain farming or ranching with some engaged in a combination of these enterprises. Forty-five per cent of the farms are cash grain operations, forty-one per cent are livestock farms, 9 per cent are general farms and 5 per cent are miscellaneous types of farms, as given in table 17. The number of people employed in all other occupations combined is less than half the number employed in agriculture. Agricultural income of the basin was derived from livestock and their products, 55 per cent, and 45 per cent was from crops in 1954, as shown in table 12. A comparison of socio-economic factors in 1950 as presented in table 20 indicates that the Little Missouri Basin is below normal when compared to the economic level of the United States. Income per family is lower, the farm operator level-of-living is lower, housing facilities are less desirable and the people generally have less education.

Economic Activity

Economic activity in the watershed is predominately agricultural. Sixty per cent of the total labor force was employed in agriculture in 1950. Occupations of persons employed in the basin in 1950 is as follows:

Name of Occupation	Persons Employed Over 14 years of age
1. Agriculture	4,644
2. Wholesale & Retail Trade	780
3. Professional and related services	421
4. Transportation, communications and other public utilities	323
5. Business and personal services excluding private households	269
6. Construction	225
7. Manufacturing	110
8. Finance, insurance and real estate	62
9. Mining	33
10. Forestry and fisheries	4
11. Not reporting	925
Total	7,796

The preceeding list is based on table 3, County and City Data Book, 1952, Bureau of The Census. Figures have been adjusted to the basin portion of the 14 counties within the watershed.

Table 12.- Value of farm products sold by source in the five principal counties of the Little Missouri River Basin, Montana and North Dakota, 1954

	Montana	North Dakota Counties					
	Carter County	Billings	Golden Valley	McKenzie	Slope	Five County Total	Part of all sales, percent
Part of county in the area, %	73	71	95	64	63	71	
Number of farms	432	359	424	1,203	447	2,865	
Value of products sold:							
All farm products sold, dollars	4,437,581	1,385,460	2,894,639	7,510,832	2,369,947	18,598,459	100.00
All crops sold, dollars	547,601	473,278	2,045,254	4,002,658	1,247,127	8,315,918	44.71
Field crops sold, dollars	547,601	473,263	2,045,077	4,000,879	1,247,082	8,313,902	44.70
All livestock & livestock products sold, dollars	3,886,454	912,182	849,235	3,506,648	1,122,820	10,277,339	55.26
Dairy products sold, dollars	30,212	71,888	69,667	214,943	94,944	481,654	2.59
Poultry & poultry products sold, dollars	12,363	13,543	28,335	59,779	20,574	134,594	.72
Livestock & livestock products other than dairy & poultry sold, dollars	3,843,879	826,751	751,233	3,231,926	1,007,302	9,661,091	51.95
Forest products sold, dollars	3,526	-	150	1,526	-	5,202	.03
Average sales per farm:							
All farm products, dollars	10,272	3,859	6,827	6,243	5,302	6,492	100.00
All crops sold, dollars	1,268	1,318	4,824	3,327	2,790	2,903	44.72
All livestock & livestock products, dollars	8,996	2,541	2,003	2,915	2,512	3,587	55.25

Compiled from 1954 Census of Agriculture, Vol. 1 - parts 11 and 27, U. S. Department of Commerce, Bureau of the Census, Washington, 1956.

Population

In 1950 there were 18,524 inhabitants in the basin. Rural farm exceeded rural non-farm population. Eight thousand and twenty-five people lived in towns or villages and 10,499 lived on farms or ranches. The population and decennial changes in population since 1910 is shown below.

Year	Population	Population change, percent	
1900	4,570		
1910	17,410	1900-1910	+281
1920	25,600	1910-1920	+ 47
1930	24,770	1920-1930	- 3
1940	19,494	1930-1940	- 21
1950	18,524	1940-1950	- 5

There were no urban places in the basin in 1950. Density of population in the basin averaged 1.8 persons per square mile. Beach, North Dakota with 1,461 inhabitants was the largest town, followed by Watford City, North Dakota with 1,371 people; Ekalaka, Montana with 904 and Wibaux, Montana with 739. All other towns had less than 500 people. In 1930 these towns were considerably less in population. Beach had 1,106 people then, Watford City counted 768 persons, Ekalaka numbered 433 and Wibaux was populated with 616.

Income

Median income per family in 1950 was $2,917. The national median was $3,073. Thirty-five per cent of the basin's 4,708 families were in the $2,000 or less median income category for that year. Twenty per cent were in the $5,000 or more bracket in 1950. This compares to national figures of 29.2 per cent in the $2,000 or less category and 20.1 per cent in the $5,000 or more group in that year. Dollar incomes within the basin are probably more effective, valuable and subject to less demand than the U.S. average. Table 20 of the appendix section shows data on several socio-economic studies of the basin in comparison with corresponding figures for the United States in 1954.

Product Values

Sale values of agricultural commodities shows livestock to be the dominant product. Values based on census figures for products sold in 1949 are as follows:

	Products	Sale Value
1.	Livestock and livestock products other than dairy and poultry	$12,995,000
2.	All crops	7,542,000
3.	Dairy	475,000
4.	Poultry	190,000
5.	Forest	17,000
	Total	$21,219,000

This list is derived from census figures of 1949 adjusted on the basis of the portion of counties within the area. Values for mineral products are not available for the basin as a whole. The approximate value of coal, oil and gas produced from public domain in 1957 was three million dollars. Royalties and lease rentals within the area paid to the Federal Government amounted to $613,633 in 1958, as shown in the minerals section of this report.

Values of farm products sold by source type is presented in table 12 for the five counties which have the majority of their area within the basin. This 1954 information shows that livestock and livestock products sales of over ten million dollars are 55 per cent of total sales. Crops sold were in excess of eight million dollars or 45 per cent of total sales. This tabulation gives data for each of the five counties and the five county total. Carter County, Montana leads in livestock and livestock product sales with $3,886,454, which is seven times the amount of crops sold in that county. Billings County, North Dakota, is the only other county where livestock sales predominate. Livestock and livestock sales there are nearly double those of crop sales. Sales of the two types are about equal in Slope County. In McKenzie County livestock and their products had sales totaling only seven-eighths of the amount received from crop sales. In Golden Valley County the portion was less than one-half. Dairy and poultry products furnished only 3.31 per cent of the farm sales in the five counties in 1954.

Cattle, sheep and wool sales produced over fifty per cent of farm sales. Sales of forest products from farms are negligible, contributing only $5,202 or only three-hundredths of one per cent of the total sales.

Average sales per farm are also given in table 12 for each of the five counties and for their total. Average sales per farm were $6,492 in the five counties in 1954, the range being from $3,859 in Billings County to $10,272 in Carter County. The low figure in Billings County indicates that there may be some marginal farms or ranches there, and that further consolidation of units may be anticipated there. Livestock and their products averaged sales of $3,587 per farm, the range being from $2,003 in the wheat producing County of Golden Valley to $8,996 in Carter County. Crop sales per farm totaled $2,903 on the average in the area, with a range from $1,268 in Carter County to $4,824 in Golden Valley County.

Livestock Numbers and Grazing Capacity

Livestock numbers in the basin, according to the agricultural census of 1954, determined from county figures multiplied by the portions of the counties in the basin, were as follows: cattle, 235,946; sheep, 187,657; horses, 9,459. This is a total of 282,936 animal units which are dependent upon the grazing lands, pastures and supplementary feeds of the area. This is equivalent to 27.3 animal unit years per square mile with no allowance for wild-life or for supplementary feeds which might be shipped in. The 1954-55 field inventory indicated that the average recommended stocking rate for the grazing land only as surveyed was approximately 9.36 animal unit years per square mile. As shown in figure 3, this survey included all public domain lands and 449,305 acres of private and state owned land. The difference in quality of these lands as measured by recommended stocking rates is shown below:

Type of Ownership	Square Miles	Animal Unit Years per square mile	Animal Unit Years Total
Public domain in classification area	703	8.43	5926
Public domain in isolated tracts	152	9.84	1496
State land in classification area	74	9.81	729
Private land in classification area	651	10.19	6638
Totals and average	1580	9.36	14789

Crop Production and Value

Statistics for crop production are difficult to obtain for the basin. Data for this, as for virtually all other information, is compiled by counties. Since parts of 14 counties are within the basin with portions varying from . 14 of one per cent to 95 per cent of the county within the basin, it is evident that exact data is not readily available. Data is presented for the five counties in the basin which have over half of their area within the basin. These statistics are considered to be reasonably comparable to the entire basin area, and are utilized throughout the report. Table 13 shows nine crops, their value, acreage harvested and total yield. This is based upon 1954 statistics for the combined area of five representative counties comprising an area equal to 94 per cent of the Little Missouri Basin. Similar information for 1955 is presented in table 14 for each of the five counties as well as for their total.

Relative importance of the leading crops produced in the five principal counties of the area is shown in table 14. Eight crops account for nearly all production: wheat, hay, barley, flax, oats, rye, potatoes, and corn. This listing is in the order of their value as harvested in 1955. Data for hay is given as tame hay, wild hay and all hay. Wheat is the most important crop both in area and value in all of the counties except Carter County where hay precedes wheat in both value and area. Area harvested, yield and value are given for each of the important crops in each of the principal counties in the area, and also for the total of the five counties. Most of the corn crop in the area, 62 per cent, is grazed in the field or cut for fodder. Thirty-four per cent of the corn crop is cut for silage and only four per cent is harvested for grain. Data for use of the corn crop in the five principal counties in the area are as follows, according to the Census figures for 1954:

	Montana	North Dakota Counties				Five
	Carter County	Billings	Golden Valley	Mc Kenzie	Slope	County Total
Corn, acres harvested	6,226	7,999	21,089	15,738	16,046	67,098
Harvested for:						
grain, percent	3.6	2.2	5.7	1.9	5.1	4.1
silage, percent	6.3	32.6	26.9	42.4	44.9	33.6
fodder or grazed, percent	90.1	65.2	67.4	55.7	50.0	62.3

Table 13. - Value, area harvested, and yield of the principal crops produced in Carter County, Montana, and in Billings, Golden Valley, McKenzie and Slope Counties in North Dakota, 1954

Crop	Value (dollars)	Acres Harvested	Total Yield
1. Wheat	$7,276,351	356,747	3,368,681 bu.
2. Tame Hay	2,284,300	119,656	114,212 tons
3. Wild Hay	941,820	78,913	47,094 tons
All Hay	3,226,120	198,569	161,306 tons
4. Barley	607,369	48,932	672,548 bu.
5. Oats	531,338	45,155	817,455 bu.
6. Flax	494,950	50,420	178,677 bu.
7. Potatoes	297,423	710	101,858 cwt.
8. Corn	1,324,097	58,213	973,601 bu.
Total	$13,862,639	761,666	

The respective portions of each of these counties within the Little Missouri River Basin area are: Carter 73%, Billings 71%, Golden Valley 95%, McKenzie 64%, and Slope 63%. These are the only counties with over one-half of the county located within the Little Missouri River Basin Area.

Most of the corn crop is cut for fodder, or grazed in the field. Yield and value for all corn has been determined from the part harvested for grain.

Compiled from Montana Agricultural Statistics, Volume VI, Montana Department of Agriculture, Helena, Montana, December 1956; and from Agricultural Statistics of North Dakota, July 1, 1954 to June 30, 1956; Department of Agriculture and Labor, State of North Dakota, Bismarck, North Dakota.

Table 14. - Area harvested, yield and value of the principal crops produced in the five principal counties of the Little Missouri River Basin, Montana and North Dakota, 1955

	Montana	North Dakota Counties				Five County
	Carter County	Billings	Golden Valley	McKenzie	Slope	Total
Wheat: acres harvested	16,984	30,307	65,057	141,514	78,063	331,925
yield, bushels	173,435	407,067	1,016,152	2,534,363	879,491	5,010,508
value, dollars	345,136	810,063	2,022,142	5,043,382	1,750,187	9,970,910
Tame hay: acres harvested	38,400	8,766	4,620	32,377	17,896	102,059
yield, tons	26,000	9,575	4,422	50,576	15,209	105,782
value, dollars	520,000	191,500	88,440	1,011,520	304,180	2,115,640
Wild hay: acres harvested	22,800	13,110	10,074	33,337	7,958	87,279
yield, tons	13,700	7,930	5,388	21,098	4,399	52,515
value, dollars	242,200	140,202	95,260	417,318	77,774	972,754
All hay: acres harvested	61,200	21,876	14,694	65,714	25,854	189,338
yield, tons	39,700	17,505	9,810	71,674	19,608	158,297
value, dollars	762,200	331,702	183,700	1,428,838	381,954	3,088,394
Barley: acres harvested	5,700	6,719	14,242	23,909	10,752	61,322
yield, bushels	85,500	138,176	328,761	577,624	183,193	1,313,254
value, dollars	66,700	107,777	256,434	450,547	142,891	1,024,349
Oats: acres harvested	3,600	8,350	9,162	22,152	11,452	54,716
yield, bushels	86,400	235,495	235,050	726,095	266,200	1,549,240
value, dollars	44,100	120,102	119,876	370,308	135,762	790,148
Flax: acres harvested	400	1,060	2,936	13,008	5,913	23,317
yield, bushels	2,200	5,602	17,455	100,946	25,617	151,820
value, dollars	5,700	14,509	452,085	261,450	66,348	800,092
Corn: acres harvested	7,200	8,491	20,984	15,442	17,467	69,584
yield, bushels 1/	98,500	198,689	310,563	373,696	244,538	1,225,986
value, dollars 1/	137,900	278,165	434,788	523,174	342,353	1,716,380
Potatoes: acres harvested	20	70	582	283	110	1,065
yield, bushels	1,166	3,919	24,262	55,490	5,007	89,844
value, dollars	2,200	7,407	45,855	104,876	9,463	169,801
Rye: acres harvested	400	6,875	198	8,372	6,986	22,831
yield, bushels	4,000	104,545	3,500	156,515	82,492	351,052
value, dollars	3,800	109,772	3,675	164,341	86,617	368,205
Total: acres harvested	94,530	83,256	127,960	290,690	155,176	751,612
value, dollars	1,245,992	1,522,449	3,135,962	7,865,762	2,608,844	16,379,009
County Area, acres	2,120,320	728,960	648,960	1,798,400	784,640	6,081,280
Portion within basin, percent	73	71	95	64	63	71
Area within basin, acres	1,555,840	518,080	613,760	1,159,360	493,440	4,340,480

1/ Only four percent of the corn crop is harvested for grain; 62 percent is grazed or cut for fodder and 34 percent is used for silage. Yield and value of the entire crop has been calculated from the portion harvested for grain. Actual value is probably higher for the uses as harvested for livestock.

Compiled from Montana Agricultural Statistics, Volume VI, Montana Department of Agriculture, Helena, Montana, December 1956, and Compiled Agriculture Statistics of North Dakota, Department of Agriculture and Labor, Bismarck, North Dakota, 1956.

Transportation

U.S. Highway 10 crosses the northern portion of the basin in an east-west direction, running through Medora and Beach, North Dakota. Forty-five miles to the south is U.S. Highway 12 running in an east-west direction through Rhame and Marmarth, North Dakota. Ninety miles further south is U.S. Highway 212, running in an east-west direction through Alzada, Montana. U.S. Highway 85 runs in a north-south direction from Watford City to Grassy Butte, North Dakota. The total accumulated distance of all U.S. Highways within the basin is 157 miles. Main lines of two trans-continental railroads, the Northern Pacific and the Chicago, Milwaukee, St. Paul and Pacific, pass through the northern half of the basin from east to west. The Chicago, Milwaukee, St. Paul and Pacific is routed through Rhame and Marmarth, North Dakota. The Northern Pacific passes through Wibaux, Montana and Beach and Medora, North Dakota. A spur line starts at Beach, North Dakota and terminates at Ollie, Montana. The Great Northern Railway has a spur line entering the basin from the west which terminates at Watford City, North Dakota.

Tourism

The basin is long and narrow, running for a distance of about 250 miles north and south and only about 50 miles east and west. Tourists enroute from east to west or west to east are in and out of the basin in a relatively short period of time. The basin has 157 miles of U.S. Highways, but none run the full length of the basin from north to south. In this respect the basin is at a disadvantage. Theodore Roosevelt National Memorial Park, both sections of which are located within the watershed, attracts tourists and rewards them with an excellent preception of an erosional phonomenon. It is made up of rugged, colorful badlands, one of the most distinctive topographic features of the West. In 1956 the park was visited by 154,694 people. Both sections of the park make up a total of 65,558 acres.

Recreation

Theodore Roosevelt National Memorial Park presents outstanding scenic attractions. It is well provided with access roads, lookout points and other facilities for recreation. Two districts of Custer National Forest within the basin offer several small campgrounds which are used by local residents and tourists. Deer, antelope, upland game birds, ducks, coots and geese are species of wildlife available for hunters during specified seasons. Resident stockmen, anxious to protect their property, as well as to keep the number of antelope within reasonable limits, devote a considerable amount of their time during hunting season to guiding hunters over lands in their vicinity.

Garrison Reservoir will provide all water sports and a sport fishery of considerable importance. Bass, bream, perch and catfish have been stocked in many of the small reservoirs in the area. The Little Missouri River and its principal tributaries also afford some fishing.

Economic Outlook

Development of oil is making rapid economic growth in the basin. Total Federal receipts from mineral leasing of public domain in 1957 were $613,633. Producing royalties alone were $365,585 indicating a value of $2,924,680 produced from government land. If one half of the oil produced in the basin is not subject to Federal royalty, which is a reasonable assumption, the value of oil and gas production in the area was approximately $5,849,360 annually in 1957. Beyond taxes and the portion of the royalties paid to the states and counties, and local costs of production which may be utilized within the basin, relatively little of this production of wealth will benefit the basin directly.

Oil and gas development contributes substantially to county taxes by taxes on improvements such as wells, gathering lines and pipe lines. The Butte pipe line, a 16 inch line conveying oil from Montana fields to the Platte pipe line, contributes substantially to the tax income of Carter County. The 12 inch gas transmission lines crossing the area to Bismarck, North Dakota and to the Black Hills cities are also substantial sources for local taxation for social, governmental, service and developmental activities of the counties within the area. Gas development in the area is old, dating back to 1910. Successful oil development is recent, starting with the Williston Basin discoveries in North Dakota in 1951. The first commercial oil production in the basin started in 1952 and has expanded rapidly since, with probable further expansion in area and production both from the extension of present recent fields and from possible new discoveries. Four new discoveries were made in the area in 1957 and 11 were developed in 1958. Twenty-four named oil fields were in production in the area in 1958 at the locations shown in figure 2.

Moderate increase may be expected in tourism and recreational economy within the basin. Future agricultural economic improvement of the area is largely limited to technical advances which may be applied in the fields of crops, breeding, management, equipment and operation. Very nearly the maximum area suitable for cultivation under present economic and land use standards is already being cropped. Sites, water supply volume and quality make additional irrigation development difficult. Towns in the area will probably continue to grow as both rural and town inhabitants and travelers will desire and support more services, commodities and higher standards.

LAND USE

Use of land in the Little Missouri Basin may be placed in three categories. About 79 per cent is used for grazing, 20 per cent for the production of crops, and 1 per cent is reserved for recreation, the Theodore Roosevelt National Memorial Park.

Rangeland Use

In 1954 about 5,240,170 acres, or 79 per cent of the basin area was used for grazing. A small part of this area has tree cover and produces some timber.

Use of this large area is restricted to grazing because of site topography, soil limitations and rainfall. Predominantly the surface varies from steeply rolling to gently rolling and extremely broken, The average annual precipitation ranges from 12.29 to 17.61 inches as shown in table 2. This is the highest use for this land and is in keeping with its capability.

This grazing land is used by 282,936 animal units of domestic livestock and 11,300 head of antelope and deer. In addition to the grazing land, most of the livestock are provided with some farm pasture and supplementary feed. The wildlife have access to other grazing areas, but their number is a quite constant use of the grazing lands of the basin. In addition to the big game there is a considerable use of the area by minor grazing animals, mostly several kinds of rodents.

Cropland Use

In 1954 about 20 per cent or 1,326,432 acres of the basin was cropland, including the areas harvested, crop failure and fallow. Wheat, hay and six other crops were predominant as indicated in table 13. Wheat and hay together occupied approximately half of the cropland, and acreage of these two was about equally divided. The acreage ratio of cash crops to forage crops was about four to one. Irrigation was largely confined to tame and wild hay. Nearly 1,000 acres was considered to be under irrigation in 1954. Most irrigation units were individually engineered and developed. This amounted to .075 per cent of the basin's cropland. A tabulation is presented on the next page showing the extent of irrigation in the Little Missouri Basin in comparison with the 17 western states and with the United States.

Area	Acres Cropland	Acres Irrigated	Per cent Cropland Irrigated
Little Missouri Basin	1,326,432	1,000	.075
17 Western States	159,517,000	19,434,000	12.1
United States	375,000,000	21,000,000	5.5

Direct comparisons of amounts of the principal crops grown in the area are shown in table 15 on a percentage basis. Contrast is given for the 9 leading crops in area harvested, part of the county area devoted to each crop, and the percentage of the total value produced by each crop. This information is given for each of the five principal counties in the area, and also for the combined area of these five counties. Information in table 15 shows relative land use for each principal crop within each of the five counties and also the variation among the counties in 1955. Wheat is the leading crop in the area, and in the total area of the five counties and also the variation among the counties in 1955. Wheat is the leading crop in the area, and in the total of the five counties wheat is 44 per cent of the harvested area but only $5\frac{1}{2}$ per cent of the total area. Value of the wheat crop is 61 per cent of total crop value in the five county area. Among the five counties, wheat varies from 18 to51 per cent of the harvested area and from eight tenths of one per cent of the county area to ten per cent. Range in value among the five counties is from 28 to 64 per cent.

Hay is the principal crop in Carter County, Montana. Tame hay and wild hay both exceed wheat in area harvested in Carter County. The value of tame hay exceeds the value of wheat. Wheat is 28 per cent of the value of all leading crops in Carter County, tame hay is 42 per cent, wild hay is 19 per cent, and all hay is 61 per cent of the total value. Range for all hay among the five counties is from $11\frac{1}{2}$ per cent to 65 per cent in harvested area and from 6 per cent to 61 per cent of total value.

Variations in areas planted and harvested, yields, production, price per bushel and returns per harvested acre for wheat in Carter County, Montana are presented in table 16.

Table 15. - Percentages of total harvested areas, county areas and value for the principal crops produced in the five principal counties of the Little Missouri River Basin, Montana and North Dakota, 1955

	Montana	North Dakota Counties				
	Carter County	Billings	Golden Valley	McKenzie	Slope	Total
Wheat:						
% hvstd area	17.97	36.40	50.84	48.68	50.31	44.16
% county area	.80	4.16	10.02	7.87	9.95	5.46
% total value	27.70	53.21	64.48	64.12	67.09	60.88
Tame Hay:						
% hvstd area	40.62	10.53	3.61	11.14	11.53	13.58
% county area	1.80	1.20	.71	1.80	2.28	1.68
% total value	41.73	12.58	2.82	12.86	11.66	12.92
Wild Hay:						
% hvstd area	24.12	15.75	7.87	11.47	5.13	11.61
% county area	1.08	1.80	1.55	1.85	1.01	1.44
% total value	19.44	9.21	3.04	5.31	2.98	5.94
All Hay:						
% hvstd area	64.74	26.28	11.48	22.61	16.66	25.19
% county area	2.88	3.00	2.26	3.65	3.30	3.11
% total value	61.17	21.79	5.86	18.17	14.64	18.86
Barley:						
% hvstd area	6.03	8.07	11.13	8.22	6.93	8.16
% county area	.27	.92	2.19	1.33	1.37	1.01
% total value	5.35	7.08	8.18	5.73	5.48	6.25
Oats:						
% hvstd area	3.81	10.03	7.16	7.62	7.38	7.28
% county area	.17	1.15	1.41	1.23	1.46	.90
% total value	3.54	7.89	3.82	4.71	5.20	4.82
Flax:						
% hvstd area	.42	1.27	2.29	4.47	3.81	3.10
% county area	.02	.15	.45	.72	.75	.38
% total value	.46	.95	14.42	3.32	2.54	4.88
Corn:						
% hvstd area	6.59	9.61	16.48	5.41	10.34	8.93
% county area	.29	1.10	3.25	.88	2.05	1.10
% total value	1.30	1.39	1.66	.53	1.37	1.02
Potatoes:						
% hvstd area	.02	.08	.45	.10	.07	.14
% county area	-	.01	.09	.02	.01	.02
% total value	.18	.49	1.46	1.33	.36	1.04
Rye:						
% hvstd area	.42	8.26	.15	2.88	4.50	3.04
% county area	.02	.94	.03	.47	.89	.04
% total value	.30	7.21	.12	2.09	3.32	2.25
Total:						
area hvstd, acres	94,530	83,256	127,960	290,690	155,176	751,612
co. area, acres	2,120,320	728,960	648,960	1,798,400	784,640	6,081,280
value, dollars	1,245,992	1,522,449	3,135,962	7,865,762	2,608,844	16,379,009
% co. area hvstd	4.46	11.42	19.72	16.16	19.78	12.36
% co. area in basin	73.	71.	95.	64.	63.	71.
Area basin, acres	1,555,840	518,080	613,760	1,159,360	493,440	4,340,480

Compiled from Montana Agricultural Statistics, Volume VI, Montana Department of Agriculture, Helena, Montana, December 1956, and Compiled Agriculture Statistics of North Dakota, Department of Agriculture and Labor, Bismarck, North Dakota, 1956. Data for corn is for 1954, from 1954 Census of Agriculture, Volume 1 - parts 11 and 27, U. S. Department of Commerce, Bureau of the Census, Washington, 1956.

Table 16. - Areas planted and harvested, yields, production, prices and returns of wheat in Carter County, Montana, 1919-1955

Year	Area Planted Acres	Area Harvested Acres	Yield per Planted Acre bu.	Yield per Harvested Acre bu.	Per Harvested Acre + or -8bu. Break-even Yield	Production (bushels)	Price per Bushel	Returns per Harvested Acre
1919	10,700	3,100	.7	2.4	-5.6	7,400	$2.38	$ 4.89
1920	19,000	18,000	17.5	18.4	+10.4	332,000	1.31	24.10
1921	16,500	15,500	6.7	7.2	- .8	111,200	.88	6.34
1922	15,000	15,000	14.0	14.0	+6.0	210,000	.92	12.88
1923	20,000	19,000	9.6	10.1	+2.1	192,000	.85	8.59
1924	14,300	13,800	11.6	12.0	+4.0	166,000	1.27	15.24
1925	18,400	17,400	8.5	9.0	+1.0	157,000	1.43	12.87
1926	18,000	18,000	8.1	8.1	+ .1	146,000	1.16	9.40
1927	17,100	17,000	19.5	19.6	+11.6	334,000	1.00	19.60
1928	21,000	20,000	14.4	15.1	+7.1	303,800	.87	13.14
1929	20,300	18,900	8.9	9.5	+1.5	180,100	1.02	9.69
1930	18,800	16,800	8.7	9.7	+1.7	163,500	.61	5,92
1931	18,300	7,900	3.0	7.0	-1.0	55,300	.55	3.85
1932	20,400	18,700	13.1	14.3	+6.3	267,200	.39	5.58
1933	20,000	15,400	7.7	10.0	+2.0	154,000	.66	6.60
1934	8,700	6,500	1.7	2.3	-5.7	15,000	.91	2.09
1935	21,600	18,000	5.2	6.3	-1.7	113,000	.99	6.24
1936	27,600	400	0.0	3.2	-4.8	1,300	1.28	4.10
1937	19,100	13,200	5.2	7.5	- .5	99,400	1.05	7.88
1938	24,200	22,100	5.2	5.7	-2.3	125,000	.52	2,96
1939	13,300	10,600	6.8	8.5	+ .5	90,300	.67	5.70
1940	16,700	12,800	4.4	5.8	-2.2	73,700	.65	3.77
1941	14,400	13,900	10,8	11.2	+3.2	155,400	.91	10.19
1942	12,600	12,100	14.0	14.6	+6.6	176,700	1.07	15.62
1943	9,100	8,400	7.2	8.9	+ .9	74,400	1.30	11.57
1944	10,800	10,400	12.3	12.8	+4.8	132,800	1.36	17.41
1945	11,700	9,900	8.3	9.8	+1.8	97,500	1.49	14.60
1946	10,800	10,500	10.2	10.5	+2.5	110,500	1.90	19.95
1947	18,900	17,900	14.1	14.9	+6.9	266,800	2.40	35.76
1948	23,200	21,200	12.0	13.2	+5.2	279,200	1.94	25.61
1949	37,400	21,700	2.6	4.4	-3.6	95,600	1.96	8.62
1950	24,100	22,300	10.7	11.5	+3.5	257,400	1.95	22.43
1951	44,100	37,100	7.4	8.8	+ .8	328,300	2.03	17,86
1952	43,800	34,400	6.0	7.6	- .4	262,500	2.02	15.35
1953	44,200	33,200	7.6	10.1	+2.1	334,100	2.00	20.20
1954	30,700	29,800	7.3	7.5	- .5	223,900	2.14	16.05
1955	28,500	27,400	11.4	11.9	+3.9	324,800	1.99	23.68
37 yr. average	20,632	16,984	8.4	10.2	+2.2	173,435	1.29	13.16

Average yields and returns are weighted averages. Seventy-seven per cent of the area of Carter County is within the Little Missouri River Basin. Area planted but not harvested may not be a total loss, as much may be cut for hay some years if prospects for grain harvest are poor. The break-even figure will vary with many conditions.

Compiled from Montana Agricultural Statistics, Volume V and VI, Montana Department of Agriculture, Helena, Montana, 1954 and 1956.

Table 16 covers a 37 year period, 1919-1955. This information not only shows the variation in production of wheat, but also indicates the probable fluctuation in the production of range forage and feed crops in the area. Yield per harvested acre varied from 3.2 bushels to 19.6 bushels. Range in production was from 1,300 bushels to 334,100 bushels, and returns per harvested acre varied from $2.96 to $35.76. Area planted varied from 8,700 acres to 44,200 acres. Harvested area varied from 400 acres to 37,100 acres. Price per bushel ranged from 39 cents to $2.40. Yield and returns data for Carter County, Montana as shown in table 16 are typical for the entire basin. In the 37 year period, crops were below the 8 bushels per acre break-even figure 12 years, and exceeded that amount less than one bushel in four years. Yields were below the break-even figure or nearly so in 16 years or nearly one-half of the 37 year period. The eight bushel break-even figure may be regarded as fairly typical, but any cost of production figure will vary widely with prices, costs, units, operators and many other variables.

Five years of below break-even yields of less than 8 bushels per acre occurred in succession in the period 1934-1938. Six such years occurred in the eight year period 1934-1940. Seven were in the ten years from 1931 to 1940. Maintenance of operations over such an adverse period calls for reserves, skillful management, difficult adjustments and probable relief and support measures. These data emphasize the marginal nature of crop production in the area. Only the most suitable land should be cultivated, and that under an active conservation program.

Similarity of yields and returns for wheat in the rest of the basin over the period is shown by considering data for Fallon and Wibaux Counties in Montana over the same 37 year period. Fallon County average yields per harvested acre show yields below the eight bushel break-even figure for twelve years with only 25 years above the break-even figure. Seven years were at or below the break-even figure in an 8 year period, 1931 to 1938. Two years had yields of less than one bushel above the break-even figure, and two more were only 9 bushel average yields. Wibaux County in Montana had eleven years of average wheat yields below the eight bushel break-even figure in the 37 years, 1919-1955. Two more years, 1930 and 1931, were an even eight bushel yield. Six of the low yields were successive, 1933-1938. Yields were at or below the eight bushel figure in eight out of nine years from 1930 to 1938. Only 24 or 65 per cent of the 37 years exceeded an eight bushel average yield.

The 37 year average yield per harvested acre was 11.9 bushels in Carter County, 9.95 bushels in Fallon County and 11.65 bushels in Wibaux County. The average for the three counties is 11.17 bushels per acre, only 3.17 bushels over the selected break-even yield of 8 bushels per acre.

More elaborate tabulations and exhibits of wheat yield variations are available in tables 8 and 9 and in figure 4 in the Lower Yellowstone Area report of the Bureau of Land Management of May, 1958. That area is located immediately west of the Little Missouri River basin. Variations in yield are principally due to variations in precipitation and of its efficiency. This is clearly shown in figure 4 of the Lower Yellowstone detail report of the Bureau of Land Management which shows yield, precipitation, prices and returns per acre for the 37 year period 1919 - 1955.

Number of farms by size and type in the five principal counties in the basin area is presented in table 17. Larger farms predominate, 1,000 acre and larger farms being $43\frac{1}{2}$ per cent of the total number in the combined five county area. This is the largest size class in all of the counties except Slope, where the next largest size group, 500 to 999 acres, has the first place. Large size farms, 1,000 acres and over, comprise 82 per cent of the farms in Carter County, Montana, and only 35 per cent of the farms in McKenzie County, North Dakota. Farms of 500 to 999 acres are 39 per cent of all farms in Slope County, and are only 12 per cent of those in Carter County. Farms of 220 to 499 acres are the third most numerous size group in all five counties. ranging from 25 per cent of the farms in Billings County to less than one per cent of those in Carter County. Fourth group is 100 to 219 acres, varying from 12 per cent of all farms in McKenzie County to less than one per cent in Carter County. Small farms, under 100 acres, are three per cent of the farms in the area with a range from five per cent in McKenzie County to one-half per cent in Billings County. Farms as considered here includes livestock ranches, and involve the use of both range and crop lands.

Cash grain farms are the most numerous type in the area, 45 per cent of the farms in the five principal counties being of this variety, as shown in table 17. Amount of this type varies greatly among the five counties, ranging from 8 per cent in Carter County to 73 per cent in Golden Valley County. Range livestock farms are second in type, 40 per cent of all farms being devoted to this enterprise, with a variation

from 15 per cent in Golden Valley County to 86 per cent in Carter County. General farms are the third type, being 8½ per cent of farms in the five county area. This type ranges from five per cent in Carter County to 11 per cent in McKenzie County. Crop and livestock farms are the most numerous type of general farms. General farms which are principally crop farms predominate among general farms only in Carter County. Miscellaneous and unclassified farms are only five percent of all farms, varying from one-half percent in Carter County to eight percent in McKenzie County.

Table 17. - Farms by size and type in the five principal counties of the Little Missouri River Basin, Montana and North Dakota, 1954

	Montana	North Dakota Counties				Five County Total	Part of Total Percent
	Carter County	Billings	Golden Valley	McKenzie	Slope		
Number of farms:							
All farms	432	359	424	1,203	447	2,865	100
By size:							
under 100 acres	4	2	11	58	12	87	3.04
100 to 219 acres	4	16	22	139	17	198	6.91
220 to 499 acres	19	90	96	267	73	545	19.02
500 to 999 acres	52	108	135	321	173	789	27.54
1000 acres and over	353	143	160	418	172	1,246	43.49
By type of farm:							
Cash-grain	35	120	308	562	238	1,263	44.61
Dairy	-	-	5	16	10	31	1.10
Poultry	-	-	-	5	-	5	.18
Livestock other than dairy or poultry	357	196	63	377	145	1,138	40.20
General farms:	19	30	29	136	29	243	8.58
Primarily crop	13	2	-	41	-	56	1.98
Primarily livestock	-	12	3	8	5	28	.99
Crop and livestock	6	16	26	87	24	159	5.61
Miscellaneous and unclassified	2	12	15	97	25	151	5.33
Part of county within the basin area, percent	73	71	95	64	63	71	

Compiled from 1954 Census of Agriculture, Volume 1 - parts 11 and 27, U.S. Department of Commerce, Bureau of the Census, Washington, D.C., 1956. Part within the basin area was computed by the Bureau of Land Management.

Considerable data regarding farm characteristics, farm groupings, farm values, farm products values, livestock numbers and sales, and areas of nine crops harvested in the area for three years, 1944, 1949 and 1954 are presented in table 21, appendix G. This data concerns land use and economics and is for the five principal counties in the area: Carter County in Montana, and Billings, Golden Valley, McKenzie and Slope Counties in North Dakota. Land area in farms, average size of farms and value of land and buildings per farm and per acre are given. Number of farms with irrigation and the area irrigated are also shown. Farms are divided by type, into four types with three sub-types under general farms. Cash grain farms were the most numerous type in the five counties in 1954, with 1,263. Livestock farms were second in that year with 1,138. These positions were the reverse of 1949 when livestock farms led with 1,236, cash grain farms being second with 1,188. General farms dropped from 316 in 1949 to 243 in 1954. In 1949, 82 per cent of the general farms were crop and livestock farms. In 1954, only 65 per cent were of this sub-type while those that were primarily crop increased to 23 per cent from 11 per cent in 1949.

Commercial farms were grouped into six classes by volume of sales, ranging from Class I with over $25,000 of sales to Class VI with $250 to $1,199 in sales annually. Class III with sales of $5,000 to $9,999 was most numerous in 1949 with 825 farms from a total of 2,815 in the five counties. Class IV, with sales from $2,500 to $4,999 was the leader in 1954 with 794 out of a total of 2,705 farms. Class I farms were the least numerous, followed by Class VI. Class V farms with sales ranging from $1,200 to $2,499 were in third place both years with the same number, 527.

Value of all farm products sold remained quite stable during the three years, with 17 million dollars in 1944, 19 million in 1949 and $18\frac{1}{2}$ million in 1954. The year of 1949 was unusually dry with precipitation only two-thirds of normal, or nearly five inches below the long term average in the North Dakota portion of the basin. Crop yields were low, but prices were higher than in 1944. Livestock sales were greatly increased, being forced by the shortage of range forage, so total sales were highest of the three years in 1949. Crop values were lowest in that year, 7.6 million, and livestock sales were highest, 11.5 million dollars. Crop values were highest in 1944 when precipitation was 27 per cent above normal in the area. In that year crops returned 10.3 million dollars in the five counties. In 1954, with precipitation $1\frac{1}{4}$ inches above normal, they produced 8.3 million dollars. Livestock and livestock products produced 11.5 million in 1949 and 10.3 million dollars in 1954. Eighty-six per cent of this amount was produced by livestock sales in 1954 and 91 per cent in 1949.

Area of crops harvested in the five counties was reduced to 656,150 acres in 1949 from 717,618 acres in 1944. This reduction was due to the drought of 1949. In 1954 harvested area increased to 766,171 acres of cultivated crops. In addition to cultivated crops, wild hay was cut on 127,301 acres in 1949, 130,983 acres in 1944 and on 87,273 acres in 1954. Area of wild hay cut varies from year to year because of volume of the wild grasses and also because of value and need for hay. Need for hay and its high cost stimulated cutting of wild hay in the dry year of 1949 despite the low yield per acre. Area of wheat harvested declined in 1954 from the 1949 and 1944 areas because of governmental controls. This caused increases in areas of alternate crops, expecially other grain and flax. Production of tame hay has steadily increased in the area along with the increasing number of livestock. Increasing value of livestock and greater appreciation of the value of care and proper feeding is also responsible for the increased production of tame hay. Number of animal units in the five counties was 213,646 in 1944, fell off to 176,443 in the dry year of 1949, and increased to 254,982 in 1954.

Woodland and Forestland Use

Ten per cent or about 621,590 acres of the basin area is covered with a woodland type of vegetation. Virtually all of this is open or fringe stands which are also used for grazing. Approximately 3 per cent is forested and 1.5 per cent is reserved for national forest. The wooded areas are of two types; deciduous hardwoods, located mostly along the drainages, and ponderosa pine in hilly areas. The principal components along drainages are black chokecherry (Prunus virginiana-melanocarpa), wild plum (Prunus americana), buffaloberry (Shepherdia canadensis), willow (Salix spp.), eastern poplar or river cottonwood (Populus deltoides), boxelder (Acer negundo), ash(Fraxinus pennsylvanica laceolata), and elm (Ulmus americana). Cottonwood grows as a fringe of trees along the larger streams. Rocky Mountain juniper grows alone on rough land and in the badlands.

About half of the forested area, 85,000 acres, is within the boundaries of the Custer National Forest. About 94 per cent of the timber is ponderosa pine(Pinus ponderosa). The remaining 6 per cent is classified as ash, eastern poplar, and elm. The Custer National Forest within the basin is in four areas; Long Pines, Ekelaka Hills, Chalk Butte, and Short Pines. It has been estimated that if markets could be obtained these forests could sustain an annual cut of 1,000,000 feet board measure.

The Forestry Branch of the Division of Range and Forest Management, Bureau of Land Management, administers the timber which is located on public domain and is outside of the national forest. This amounts to about 85,000 acres, the bulk of which is in Crook County, Wyoming. Most of the area is a poor growing site with open stands of ponderosa pine(Pinus ponderosa). Intermingled with the poor sites are better sites growing trees of larger size and fair quality.

Recreation Land Use

The Theodore Roosevelt National Memorial Park covers one per cent of the drainage. The total acreage of 65,558 acres in in two units and the Elkhorn Ranch site. The South Unit, located in McKenzie, County, North Dakota, just north of U.S. Highway 10, contains about 42,832 acres. The North Unit, containing about 22,486 acres is also located in McKenzie County, North Dakota, about 13 miles south of Watford City. A third area, containing 240 acres is known as the Elkhorn Ranch site. This area is located along the west bank of the Little Missouri River about midway between the north and south units. The park is made up largely of the badlands formation, colloquially described as"Hell with the fires out". The park was set aside to provide public enjoyment of an interesting formation and to commemorate the site of Theodore Roosevelt's ranching enterprise in North Dakota. Much of the basin is well adapted to hunting and camping. Garrison Lake affords all types of water sports.

Indian Land Use

Part of the Fort Berthold Indian Reservation is located in the extreme northern portion of the basin. It covers approximately 358,720 acres or 5.8 per cent of the basin. This land is used for grazing, hay production and a small area of cultivated crops. This land is under the administration of the Bureau of Indian Affairs. Indian population is composed mostly of the Gros Ventre tribe. Construction of Garrison Reservoir split the reservation and eliminated the sheltered Missouri River bottom lands, creating serious problems for the Indians and the Bureau of Indian Affairs.

LANDOWNERSHIP

Surface area of the Little Missouri Basin area is 6,632,160 acres or 10,363 square miles. This includes 552,160 acres north of the Little Missouri River Basin which drains directly into the Missouri River. The basin proper covers 6,080,000 acres.

Land within the area is owned by individuals, corporations and public agencies. Landownership within the area by states is shown in table 18. Ranchmen have had considerable difficulty in securing an economic operating unit. Figure 3 shows landownership by Federal managing agencies in comparison to State and private landownership. Approximately 73 per cent or 4,813,731 acres is owned by state or private interests. Federal ownership of 1,818,429 acres accounts for about 27 per cent of the total area.

Federal Landownership

Federal landownership by type and agency in the Little Missouri River Basin area in 1954 is shown in the following list:

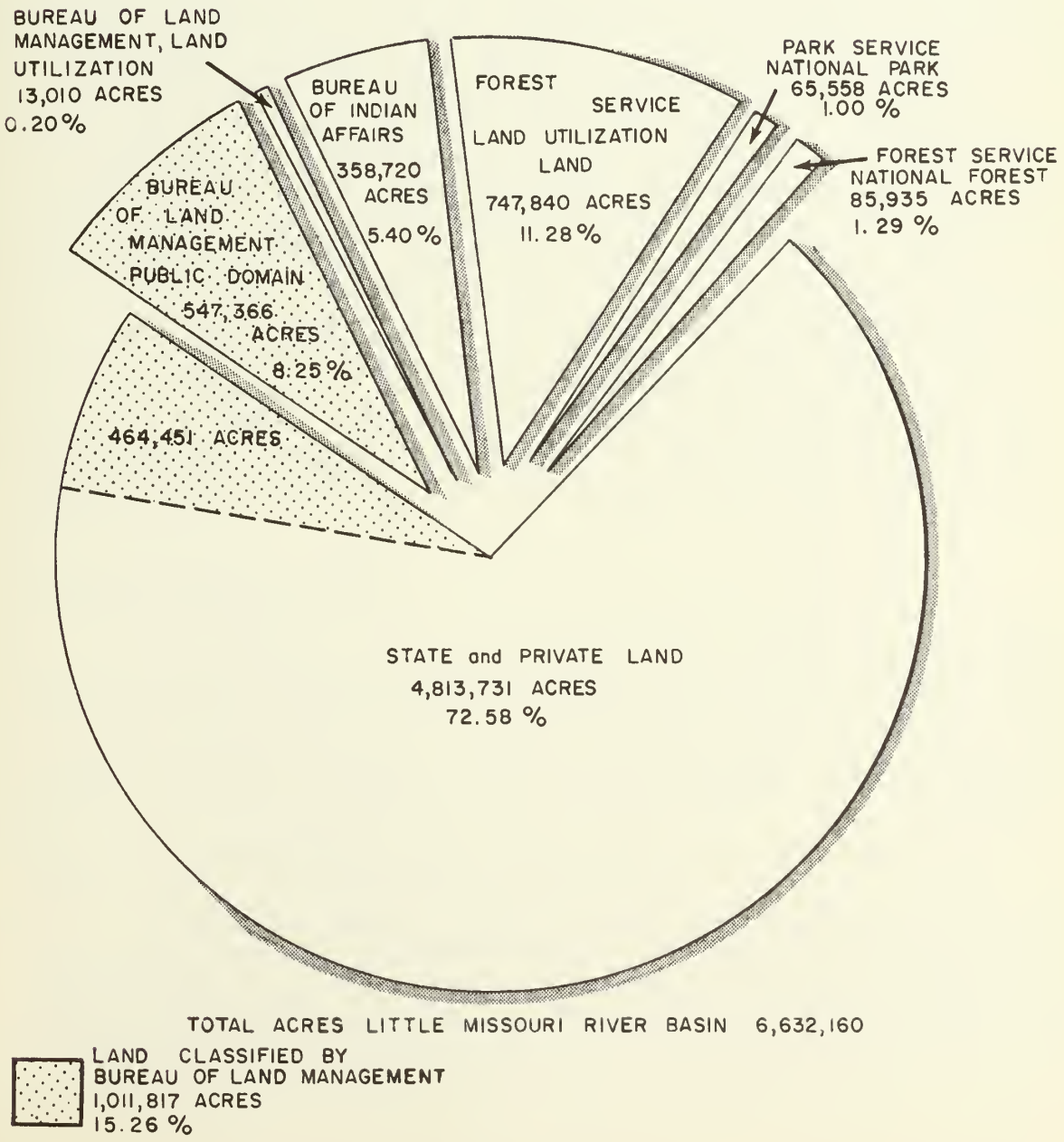
Type-Agency	Area Acres	Percent of Total Area
Public domain-Bureau of Land Mgt.	547,366	8.25
Land Utilization Project Land-Bureau of Land Management	13,010	.20
Land Utilization Project Land-Forest Service	747,840	11.28
Custer National Forest:Forest Service, U.S.D.A.	85,935	1.29
Fort Berthold Indian Reservation-Bureau of Indian Affairs	358,720	5.40
Theodore Roosevelt National Memorial Park-National Park Service	65,558	1.00
TOTAL	1,818,429	27.42

Table 18.- Landownership within the Little Missouri River Basin, Montana, North Dakota, South Dakota and Wyoming, 1955 (acres)

Type of ownership	Montana	North Dakota	South Dakota	Wyoming	Total
Public Domain administered by the Bureau of Land Management					
In large contiguous blocks	370,542	22,542	2,076	55,118	450,223
In scattered tracts	49,189	30,128	6,906	10,920	97,143
Total Public Domain	419,731	52,615	8,982	66,038	547,366
Other Federal Lands 1/					
National Forest	84,015		1,920		85,935
Land Utilization Project repurchased lands	13,010	742,750		5,090	760,850
Fort Berthold Indian Reservation		358,720			358,720
Theodore Roosevelt National Park		65,558			65,558
Total Other Federal Lands	97,025	1,167,028	1,920	5,090	1,271,063
Total all Federal Lands	516,756	1,219,643	10,902	71,128	1,818,429
Private and State Lands					
Adjacent to contiguous blocks of public domain	334,560	9,290	7,670	112,931	464,451
Associated with scattered tracts of public domain	1,317,804	2,379,867	374,228	277,381	4,349,280
Total Private and State Lands	1,652,364	2,389,157	381,898	390,312	4,813,731
Total all landownerships in contiguous block areas	706,062	31,777	9,746	168,049	915,634
Total all landownerships in scattered tract areas	1,463,058	3,577,023	383,054	293,391	5,716,526
Total all landownerships	2,169,120	3,608,800	392,800	461,440	6,632,160

1/ All other Federal Lands are associated with the scattered tracts of public domain except 960 acres of Land Utilization Project repurchased land in Montana. Data includes 552,160 acres of minor Missouri River drainages north of the Little Missouri River Basin with 6,080,000 acres. Compiled from Bureau of Land Management field data.

Figure 3. Land Administration, Landownership and Area Examined, Little Missouri River Basin, Montana, North Dakota, South Dakota and Wyoming 1954



Public Domain

The Little Missouri Basin contains 547,366 acres of public domain, 96 per cent being in the southern half of the basin. Originally this was part of the Louisiana Purchase of 1803. Broadly speaking it is land unwanted and unselected by the settlers. The Little Missouri River Basin Public Domain Map with this report shows some areas of intense concentration of public domain and other areas with scattered isolated tracts of public domain. A tract of public domain is considered to be isolated if it is not over 1520 acres in area and if the contigious tracts are all patented land. The field survey of 1954 - 55 separately classified the land under Isolated Tracts and in areas of concentration. Area classification was used for the concentrated area of public domain along with associated lands in other landownerships as shown on the Land Classification and Potential Improvement Sites Maps with this report. Isolated tracts are widely scattered pieces of public domain, surrounded by private, state or other public lands. These isolated tracts were individually classified. Table 19 of this report presents an outline of the description, location and classification of each tract in the area and provides recommendations for their future management. The field examination of each tract was reported on a land classification form 4-1090, a sample of which is shown in Appendix B. These completed reports are filed in the Montana State Office of the Bureau of Land Management at Billings for the tracts in Montana and North and South Dakota. The Wyoming classification reports are filed in the Wyoming State Office at Cheyenne.

Custer National Forest

By Executive Order No. 908, July 2, 1908, the Otter National Forest was renamed the Custer National Forest. By Executive Order No. 326, June 13, 1920, the Sioux National Forest merged with the Custer National Forest. There are 85,935 acres within the Little Missouri Basin. Further details are given elsewhere in this report.

Land Utilization Project Acquired Lands

The Little Missouri Basin contains 760,850 acres of this land in Federal ownership acquired for relief and conservation purposes in the drought years of the 1930's. Lands in this category are also called Title III lands because they were purchased under Title III of the Bankhead-Jones Farm Tenant Act of 1937. These lands make up the largest

area of Federal landownership in the basin. They are utilized only for grazing. These lands have been organized into grazing units of economic size which are administered on a conservative basis to permit range improvement. The Forest Service of the Department of Agriculture administers nearly all of this land in the basin, 742,750 acres in Billings, Golden Valley, McKenzie and Slope Counties in North Dakota and 5,090 acres in Campbell County, Wyoming. Only the Land Utilization Project land within Montana is presently administered by the Bureau of Land Management. This amounts to 13,010 acres in Fallon County. Land Utilization Project land in Montana was transferred to the administration of the Bureau of Land Management by Executive Order No. 10787 of November 7, 1958. Total area of grazing land administered by this Bureau within the basin is 560,376 acres. Land Utilization Project lands were administered by the Soil Conservation Service for many years prior to the transfer of administration to the Forest Service.

Indian Reservation Land

The Fort Berthold Indian Reservation was created on April 12, 1870 by an Executive Order signed by President U.S. Grant. The Little Missouri Basin contains 358,720 acres of this reservation.

National Park Service Land

The Theodore Roosevelt National Memorial Park was created in 1947 to commemorate this rugged President who contributed so much to National conservation. This park includes the old Elkhorn Ranch where Roosevelt built his spacious cabin of hand-hewn cottonwood logs in 1884. Additional areas contain the most beautiful and rugged badlands in the Little Missouri River Basin. The Park is utilized solely for recreational purposes under the administration of the National Park Service. Park headquarters are on the Little Missouri River four miles north of Medora, North Dakota. The Park covers an area of 65,558 acres, all within the basin.

PROBLEMS

Problems in the Little Missouri Basin fall into three groups. The first group deals with problems observed during the field survey and are mainly concerned with public domain. Problems of administration and policy are the second group. General problems common to the entire basin area are the third group. Livestock operations in the area are well stabilized. Nearly all individual allotments are completely fenced. This greatly reduces trespass and management problems and practically limits most livestock problems to the individual operators.

Problems observed during the field survey

Forage depletion Field men found 293,776 acres of rangeland that appeared to be in poor or fair condition. These condition classes indicate that the state of health of the rangeland is below a condition that could and should be expected under good management practice with normal rainfall. The range inventory study shows that the livestock grazing capacity has been reduced by about one-half on 285,162 acres and by about three-fourths on 8,614 acres. It will be difficult to restore this range area to good condition. Range improvement will require several to many years of careful management.

Excess Stocking Careful study of range forage on the area inventoried showed that 6.1 acres per month was required for the complete sustenance of one animal unit on public domain on an average over the area. All available evidence indicated that, on the average, these lands were being stocked at the rate of one animal unit per month on every 3.7 acres, or nearly twice the rate at which these lands should be utilized to maintain their condition. The 6.1 acre rate per animal unit month is also necessary to protect the watershed and to minimize erosion and sediment production.

Erosion Field men found 363,554 acres of land, 35.9 per cent of the area examined, in a state of erosion described as moderate to severe. This degree of erosion is defined as land with 25 to 50 per cent of the topsoil removed, with bare spots common and occasional gullies, shallow to deep, occuring at intervals of more than 100 feet apart. Moderate difficulty is encountered in traveling over the area in a car. Ordinarily gullies must be "headed" or passed around at the "head" or top, in order to cross.

Field examination found 14,088 acres, 1.4 per cent of the area examined, in a state of erosion described as severe to critical. This degree of erosion is land with 50 to 100 per cent of the topsoil removed. Frequent gullies are found at intervals of less than 100 feet. Active erosion is in process as shown by bank, head, and bottom cuttings. Corduroyed surface of the lands and deep gullies makes car travel impossible.

Barren lands Inventory of the 915,634 acre area, as shown on the Land Classification Map, showed 1,636 acres of barren badlands hills with little to no vegetation. An additional 3,457 acres was found in type number 7. This type is defined as land with large areas of very sparse forage or land with timber and brush so thick that it has slight value for grazing domestic livestock. The lands in this group with little or no vegetation pose a problem of severe erosion by wind and water. This, in turn resolves into a problem of sedimentation or dust.

Rodents and Fires Infestation of rangeland by prairie dogs was found at six different locations comprising a total of 1,217 acres. The largest single infested area found on public domain was 180 acres. These rodents are capable of spreading at a phenomenal rate. They can completely denude large areas among their "towns".

Forest and prairie fires are a problem. Some of these spread to serious proportions and result in unwarranted drain upon forest products, grass, wildlife, soil humus and seed crops.

Trespass Apparent agricultural trespass on public domain was found on 936 acres involving 22 tracts. Most of this was in Montana. All trespass was reported to the Bureau of Land Management District Manager.

Cadastral Survey Problems Field men experienced difficulty in locating section corners. In many places on the old surveys the old rock corners have been lost or obliterated. There are approximately 238 townships of old original surveys made prior to 1910 in the Little Missouri Basin, many of which are not properly monumented. Resurveys with the new accompanying "brass capped" monuments are needed outside of the grassed areas where durable pits mark the corners. Definite boundary identifications between subdivisions are necessary for the proper administration of the areas leased under Section 15 of the Taylor Grazing Act; for the determination of boundaries between Government

and privately owned lands; and for the information necessary in connection with the sale of timber, isolated tracts, trespass cases and for the identification of land leased for oil and gas development. Figure 3 shows the present areas of cadastral resurveys and old surveys within the basin area.

Problems of Administration and Policy Administrative and policy problems include adjudication of grazing privileges, fencing programs, public relations with states, private companies or individuals, conflicts in land use and isolated tracts. In some respects these are the most serious problems concerning the public domain. With the exception of isolated tracts these problems are largely beyond the scope of this report. Appropriate offices of the Bureau of Land Management are studying and working on these problems.

Isolated tracts Intermingled tracts of public domain among large areas of private and state lands presents a problem to the Federal land administrators. There are 868 of these tracts in the Little Missouri Basin. Ownership of private lands around these isolated tracts often brings substantial advantages to the owner who is in competition with other private owners in obtaining use of Federal land. These are cases where the adjoining landowner enjoys all the advantages of ownership of the isolated tracts without the accompanying responsibilities of management costs. Preference rights of adjoining landowners to buy these tracts often makes disposal very difficult. Most of the isolated tracts in the Little Missouri Basin present conservation and management problems that are infeasible of application by the Bureau of Land Management.

There are forested isolated tracts with 1,438 acres of timber which contain an estimated 1050 MBF of yellow pine saw timber, 191,250 yellow pine posts and poles and 48,550 juniper and ash posts. Estimated stumpage value of these timber products is $41,942. Economical utilization of these products is largely dependent upon coincident utilization of identical products on the adjoining privately-owned lands. A lack of knowledge as to procedure necessary to secure authorization for use or impatience on the part of prospective users may result in either trespass use or in leaving the products unused.

Drought Drought is an ever recurring problem. Tables 3, 4 and 5 of this report indicate the extreme variations in rainfall in the area. Climatic conditions of this kind, with alternating wet and dry seasons were responsible for waves of optimism and pessimism among the settlers. During the wet years immigrants swarmed in, and the belief gained ground that "rainfall follows the plow". . . . , but within a few years came the dry cycle, "with the heavens like brass". Drought burns crops and pastures, and if it continues over several years there is considerable emigration.

Distribution of livestock water From a range management point of view there are an inadequate number of water facilities. Forage which would normally be converted to weight gain in livestock is wasted when used as energy for excessive travel between forage and water. Existing stock dams are frequently dry due to a shortage of runoff. This leads to improper distribution of livestock and causes isolated spots of little used, and over used areas near water.

Flood Threat Floods on the Little Missouri have occured in the spring months due to general rains, ice jams, rapid runoff from snow melt or a combination of all of these. Marmarth, North Dakota, near the geographic center of the basin, has had nine major floods since 1907. Senate Document No. 134, 81st Congress, 2nd Session, Little Missouri River and Tributaries at Marmarth, North Dakota, a letter from the Secretary of the Army, states: "The most damaging flood, for which data are available, occured from a general rain in 1929. River stage rose to 16 feet on the highway bridge gauge and 26 of the town's 62 blocks were flooded to a depth of 3 to 4 feet. Damage to residential and business property amounted to about $30,000 and the city water supply was polluted. Higher recent stages have resulted from ice jams, notable that in March of 1947 when a stage of 21.7 feet was recorded at the highway bridge gauge. Several houses in the Browning addition north of the railroad were inundated by the March 1947 flood, which caused damage estimated at $3,600. The water rose at several locations to within less than 3 inches of the top of the existing levee around the main section of town. A slightly longer duration of the ice jam would have resulted in the levee being over-topped and disastrous flooding of the majority of the town. Much emergency work and evacuation of the townspeople have been required and general suffering and hardship have been endured." Future average flood damages are estimated at $11,004 based on November 1948 price levels. The 1948 population of Marmarth was about 600. The town is near the confluence of Little Missouri River and Little Beaver Creek.

Proposed Management and Development of Public Domain

Effective management and economical administration of public domain in the Little Missouri Basin are dependent upon the orderly execution of two primary action programs. The first is a disposal program of all public domain deemed inexpedient for retention due to location and resources. Second is an intensive management program covering all remaining public domain lands.

Disposal Program - Isolated Tracts Table 19 of this report lists all isolated tracts proposed for sale and private management. There are 857 tracts listed in separate sections recommended for sale with a total area of 96,193 acres. Disposal of these tracts is recommended in accordance with existing laws on the motion of the Bureau of Land Management. Eleven isolated tracts are recommended for retention in Federal ownership. Three of these, comprising 169 acres, are recommended as suitable for water storage for the Garrison Dam. Three others, recognized as suitable for multiple use, include 446 acres. One tract of 40 acres is considered to be suitable for municipal recreation. Two others are recommended for transfer, one of 15 acres to the U. S. Army and one of 40 acres to the U. S. Department of Agriculture for administration with adjacent Land Utilization Project Land. One tract of 40 acres is utilized for cemetery purposes. One tract of 200 acres should be retained for use for waterfowl.

Proposed improvements and management In view of the problems mentioned previously, it is suggested that the following practices and structures be investigated and considered in detail:

1. Proper land use and land management. Field inventory of the public domain and related lands established recommended stocking rates as shown in table 19 and on the Land Classification map with this report. Where actual use exceeds this number, proper adjustment is recommended.

2. Soil stabilization. Soil stabilization is accomplished by reducing erosion. Methods of reducing erosion are good management to promote proper cover and range improvement, seeding of depleted areas, construction of additional water facilities and fencing programs. These recommendations are in effect proper soil conservation. Seeding is recommended for 370 acres on sites shown on the Proposed Improvement Site Map. Sites are proposed for five check dams.

3. Construction of additional water spreaders. The Potential Improvement Sites map accompanying this report shows potential sites for additional water spreaders. This is a multiple-benefit practice as pointed out in 1950 by the President's Water Resource Policy Commission, Committee on Evaluation of Constructed Projects. Their evaluation is as follows: "The Alzada water-spreading system project on range lands of southeastern Montana consists of a series of earth dikes to retard surface runoff and consequent soil erosion, and to increase production for forage by providing supplemental water through spreading of flood flows. A small experimental development on heavy soils, the system covers 980 acres, of which 760 acres receive benefits from water spreading. Where the soil received heavy flooding, the original vegetation of sagebrush and cactus has given way to a thick stand of western wheat grass. The dikes and increased plant cover have effectively controlled sheet and gully erosion. The increase of 350 per cent obtained in grazing capacity has a value, based on livestock prices of the past 8 years, adequate to return costs of construction and of maintenance in a 40-year period, with an annual return of 13 per cent on the original investment of $3,300. The improvement has resulted in an increase in appraised value per animal unit of land investment from $100 to $190." Appendix H of this report contains estimates of economic returns from Bureau of Land Management range waterspreading systems at Alzada, Montana.

In the study of sediment sources in the Cheyenne River Basin, Richard F. Hadley of the U.S. Geological Survey recommends water spreading as the most effective means of sediment control where suitable sites are available. Water spreading is recommended for 120 acres as shown on the Proposed Improvements Sites Map.

4. Detention dams. Detention dams should be constructed at suitable sites to aid in flood control, reduce sediment production, and to contribute to water spreading and to livestock water supplies.

5. Additional water facilities. Potential sites for additional water facilities as recommended by field men are delineated on the Potential Improvement Sites map with this report. Additional livestock water will conserve range forage and increase livestock weight production by reducing distances traveled for water. Proper water spacing varies with forage supply, terrain, livestock prices, availability of supply and costs of development. Livestock water may

be supplied from reservoirs, wells, spring developments, streams, and even by hauling water to range locations. Sixty-eight reservoir sites have been recommended for investigation at locations shown on the Proposed Improvement Sites Map.

6. Rodent Control. Poisoning of habitat centers is recommended for rodent control. Sites where rodents should be controlled covering 190 acres are shown on the Potential Improvement Sites Map in the jacket of this report.

Table 19.- Description, Area, Classification, Suitability and Proposed Management of Unreserved Public Domain, by Counties Within the Little Missouri River Basin, Montana, North Dakota, South Dakota and Wyoming, 1955

P. M. Montana Twp. South	Range East	Sec.	Subdivision	Acres	General Land Character	AUM's	Present Land Use 1/	Land Capability Classification 2/	Principal Suitability 1/	Proposed Management
Carter County										
1	57	1	Lot 4	21.01	Gently to steeply rolling	5	1	VI	1	Private
1	57	2	Lots 1, 2, 3: $E\frac{1}{2}SW\frac{1}{4}$: $SW\frac{1}{4}SE\frac{1}{4}$	183.09	Gently to steeply rolling	41	1	98/VI:85.09/VII	1	Private
1	57	11	$N\frac{1}{2}NE\frac{1}{4}$: $NE\frac{1}{4}NW\frac{1}{4}$	120.00	Gently to steeply rolling	27	1	15/IV:105/VI	1	Private
1	57	14	$NW\frac{1}{4}NW\frac{1}{4}$	40.00	Steeply rolling to rough	10	1	32/VII:8/VIII	1	Private
1	57	35	$SE\frac{1}{4}NE\frac{1}{4}$: $SE\frac{1}{4}SE\frac{1}{4}$	80.00	Gently to steeply rolling	18	1	15/IV:65/VI	1	Private
1	58	1	Lot 4	21.47	Gently to steeply rolling	4	7-1-2-3	VII	7-1-2-3	Federal
1	58	2	Lots 1, 2, 3, 4: $S\frac{1}{2}N\frac{1}{2}$: $N\frac{1}{2}S\frac{1}{2}$	378.96	Steeply rolling, mountainous	75	7-1-2-3	215/VI:163.96/VII	7-1-2-3	Federal
1	58	3	Lot 1	45.41	Steeply rolling, mountainous	6	7-1-2-3	VII	7-1-2-3	Federal
1	58	20	$S\frac{1}{2}NE\frac{1}{4}$	80.00	Gently to steeply rolling	23	1	VI	1	Private
1	58	23	$N\frac{1}{2}NE\frac{1}{4}$: $S\frac{1}{2}SE\frac{1}{4}$: $SW\frac{1}{4}$	320.00	Sloping to gently rolling	58	1	38/VI:192/VII:90/VIII	1	Private
1	58	24	$SW\frac{1}{4}NW\frac{1}{4}$: $NE\frac{1}{4}SW\frac{1}{4}$: $W\frac{1}{2}SE\frac{1}{4}$	160.00	Level to gently sloping	21	1	74/VI:28/VII:58/VIII	1	Private
1	58	25	$NW\frac{1}{4}NE\frac{1}{4}$: $W\frac{1}{2}NW\frac{1}{4}$: $SW\frac{1}{4}$: $S\frac{1}{2}SE\frac{1}{4}$	360.00	Level to gently sloping	68	1	234/VI:50/VII:76/VIII	1	Private
1	58	26	$E\frac{1}{2}$	320.00	Level to gently sloping	59	1	105/VI:155/VII:60/VIII	1	Private
1	58	29	$NE\frac{1}{4}NW\frac{1}{4}$	40.00	Level to gently sloping	9	1	VI	1	Private
1	59	22	$SE\frac{1}{4}NW\frac{1}{4}$	40.00	Gently sloping, rolling	12	1	22/IV:18/VI	1	Private
1	59	28	$W\frac{1}{2}SE\frac{1}{4}$	80.00	Gently sloping, rolling	21	1	VI	1	Private
1	59	29	$S\frac{1}{2}SW\frac{1}{4}$	80.00	Gently sloping, rolling	20	1	VI	1	Private
1	59	30	$SW\frac{1}{4}SW\frac{1}{4}$: $E\frac{1}{2}SW\frac{1}{4}$: $SE\frac{1}{4}$	280.00	Gently to steeply rolling	70	1	VI	1	Private
1	59	32	$E\frac{1}{2}$	320.00	Gently to steeply rolling	58	1	VI	1	Private
1	59	34	$SW\frac{1}{4}NW\frac{1}{4}$: $NW\frac{1}{4}SW\frac{1}{4}$	80.00	Gently to steeply rolling	21	1	VI	1	Private
1	60	15	$NW\frac{1}{4}NW\frac{1}{4}$	40.00	Sloping to gently rolling	10	1	VI	1	Private
1	60	21	$SW\frac{1}{4}SE\frac{1}{4}$	40.00	Gently to steeply rolling	12	1	V	1	Private
1	60	29	$SE\frac{1}{4}NW\frac{1}{4}$	40.00	Gently to steeply rolling	10	1	VI	1	Private
1	60	31	$SW\frac{1}{4}SE\frac{1}{4}$	40.00	Gently rolling to sloping	10	1	VI	1	Private
1	62	2	Lots 1, 2, 3, 4, 5	156.34	Gently to steeply rolling	55	1	VI	1	Private
1	62	3	Lots 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 16, 17: $NW\frac{1}{4}SE\frac{1}{4}$	571.92	Gently to steeply rolling	177	1	VI	1	Private
1	62	4	Lots 1, 2, 3, 4, 5, 6, 7, 8, 9 10, 11, 12, 15, 16, 17	570.20	Steeply rolling to rough	137	1	370.20/VI:200/VII	1	Private

- Continued

Table 19.- Description, Area, Classification, Suitability and Proposed Management of Unreserved Public Domain, by Counties Within the Little Missouri River Basin, Montana, North Dakota, South Dakota and Wyoming, 1955 - Continued

P. M. Montana Twp. South	Range East	Sec.	Subdivision	Acres	General Land Character	AUM's	Present Land Use 1/	Land Capability Classification 2/	Principal Suitability 1/	Proposed Management
Carter County										
1	62	5	Lots 8,9,10	120.00	Gently to steeply rolling	38	1	VI	1	Private
1	62	10	NE¼SE¼	40.00	Gently to steeply rolling	12	1	VI	1	Private
1	62	15	S½NE¼	80.00	Gently to steeply rolling	21	1	VI	1	Private
1	62	23	Lots 3,4	74.88	Gently to steeply rolling	23	1	VI	1	Private
1	62	26	Lots 1,2,3	114.23	Gently to steeply rolling	30	1	90/VI:24.23/VII	1	Private
1	62	27	W½NW¼	80.00	Gently to steeply rolling	26	1	VI	1	Private
1	62	33	SE¼SE¼	40.00	Gently to steeply rolling	12	1	VI	1	Private
1	62	35	Lot 2	38.67	Gently to steeply rolling	12	1	VI	1	Private
2	56	11	S½SE¼	80.00	Gently to steeply rolling	32	1	20/IV:60/VI	1	Private
2	56	12	SE¼SW¼: Lot 1	79.43	Gently to steeply rolling	13	1	40/VI:39.43/VII	1	Private
2	56	13	NW¼NW¼	40.00	Gently to steeply rolling	10	1	VI	1	Private
2	56	14	SW¼NE¼	40.00	Gently to steeply rolling	13	1	8/IV:32/VI	1	Private
2	56	25	NW¼SE¼	40.00	Gently to steeply rolling	8	1	VI	1	Private
2	57	1	N½SW¼	80.00	Moderate to steep slopes	13	1	50/VI:30/VII	1	Private
2	57	8	NW¼NE¼	40.00	Gently to moderately rolling	12	1	VI	1	Private
2	57	9	SE¼SW¼	40.00	Gently to steeply rolling	6	1	VII	1	Private
2	59	12	SW¼NW¼:SE¼SW¼	80.00	Level to gently rolling	14	1	52/IV:28/VI	1	Private
2	60	5	Lot 4	22.25	Gently to steeply rolling	6	1	V	1	Private
2	60	3	Lot 12	40.00	Gently rolling to broken	8	1	22/IV:18/VII	1	Private
2	60	4	N½SE¼:SE¼SE¼	120.00	Gently to steeply rolling	30	1	55/IV:65/VI	1	Private
2	60	8	SE¼SW¼	40.00	Gently to steeply rolling	10	1	VI	1	Private
2	60	9	SW¼NE¼	40.00	Steeply rolling to broken	11	1	IV	1	Private
2	60	17	SE¼NE¼	40.00	Steeply rolling to broken	11	1	IV	1	Private
2	60	18	NE¼NE¼	40.00	Gently to steeply rolling	11	1	VI	1	Private
2	61	1	SW¼NE¼	40.00	Gently to steeply rolling	13	1	VI	1	Private
2	62	3	S½S½SE¼SW¼	10.00	Gently sloping	1	1	VI	1	Private
2	62	10	S½NE¼NE¼	20.00	Gently sloping	4	1	VI	1	Private

- Continued

Table 19. - Description, Area, Classification, Suitability and Proposed Management of Unreserved Public Domain, by Counties Within the Little Missouri River Basin, Montana, North Dakota, South Dakota and Wyoming, 1955 - Continued

P. M. Montana Twp. South	Range East	Sec.	Subdivision	Acres	General Land Character	AUM's	Present Land Use 1/	Land Capability Classification 2/	Principal Suitability 1/	Proposed Management
Carter County										
2	62	17	$SE\frac{1}{4}SE\frac{1}{4}SE\frac{1}{4}$:$S\frac{1}{2}SW\frac{1}{4}SE\frac{1}{4}SE\frac{1}{4}$: $S\frac{1}{2}S\frac{1}{2}SW\frac{1}{4}SE\frac{1}{4}$:$S\frac{1}{2}SE\frac{1}{4}SE\frac{1}{4}SW\frac{1}{4}$	30.00	Moderately sloping	6	1	VI	1	Private
3	60	3	$SW\frac{1}{4}$	160.00	Gently rolling, steep rocky	35	1	40/IV:25/VI:95/VII	1	Private
3	60	5	Lot 1	40.44	Moderately sloping	10	1	VI	1	Private
3	60	8	$SE\frac{1}{4}SE\frac{1}{4}$	40.00	Gently to steeply rolling	8	1	VI	1	Private
3	60	9	$SW\frac{1}{4}SW\frac{1}{4}$:$SE\frac{1}{4}SE\frac{1}{4}$	80.00	Gently to steeply rolling	19	1	70/VI:10/VII	1	Private
3	60	10	$NW\frac{1}{4}SW\frac{1}{4}$	40.00	Gently to steeply rolling	11	1	VI	1	Private
3	60	11	$W\frac{1}{2}NW\frac{1}{4}$	80.00	Gently to steeply rolling	24	1	40/VI:40/VII	1	Private
3	60	17	$E\frac{1}{2}SW\frac{1}{4}$	80.00	Gently to steeply rolling	19	1	VI	1	Private
3	60	23	$NW\frac{1}{4}SE\frac{1}{4}$	40.00	Gently to steeply rolling	8	1	25/VI:15/VIII	1	Private
3	60	25	$S\frac{1}{2}SW\frac{1}{4}$	80.00	Gently to steeply rolling	22	1	VI	1	Private
3	60	26	$NE\frac{1}{4}SW\frac{1}{4}$:$SW\frac{1}{4}SE\frac{1}{4}$	80.00	Undulating to rolling	22	1	VI	1	Private
3	60	27	$NW\frac{1}{4}NW\frac{1}{4}$	40.00	Undulating to rough	7	1	VII	1	Private
3	60	34	$NE\frac{1}{4}SW\frac{1}{4}$	40.00	Gently rolling to broken	8	1	11/IV:4/VI:25/VII	1	Private
3	60	35	$NW\frac{1}{4}SW\frac{1}{4}$	40.00	Gently rolling to broken	5	1	VII	1	Private
3	61	31	$SW\frac{1}{4}SE\frac{1}{4}$	40.00	Steeply rolling to broken	9	1	30/IV:10/VII	1	Private
4	60	2	$SE\frac{1}{4}SW\frac{1}{4}$	40.00	Very steep and rough	7	1	VII	1	Private
4	60	25	$E\frac{1}{2}W\frac{1}{2}$	160.00	Steeply rolling to rough	27	1	VII	1	Private
4	60	26	$NW\frac{1}{4}NW\frac{1}{4}$	40.00	Gently to steeply rolling	7	1	VII	1	Private
4	60	27	$SW\frac{1}{4}NE\frac{1}{4}$:$NW\frac{1}{4}SE\frac{1}{4}$:$SW\frac{1}{4}SW\frac{1}{4}$	120.00	Gently to steeply rolling	21	1	VII	1	Private
4	61	2	$SW\frac{1}{4}SW\frac{1}{4}$	40.00	Gently to steeply rolling	2	1	8/VI:32/VIII	1	Private
4	61	6	$SE\frac{1}{4}SE\frac{1}{4}$:$SE\frac{1}{4}SW\frac{1}{4}$	80.00	Gently to steeply rolling	33	1-2	30/IV:50/VI	1	Private
4	61	8	$SW\frac{1}{4}NW\frac{1}{4}$:$SW\frac{1}{4}NE\frac{1}{4}$	80.00	Steeply rolling to rough	15	1	VII	1	Private
4	61	9	$N\frac{1}{2}SW\frac{1}{4}$:$NW\frac{1}{4}SE\frac{1}{4}$	120.00	Mostly rough and steep	4	1	25/VII:95/VIII	1	Private
4	61	10	$E\frac{1}{2}NE\frac{1}{4}$:$SW\frac{1}{4}NE\frac{1}{4}$:$NW\frac{1}{4}SE\frac{1}{4}$: $NE\frac{1}{4}SW\frac{1}{4}$	200.00	Steeply rolling to rough	25	1	105/VI:95/VIII	1	Private
4	61	11	$W\frac{1}{2}NW\frac{1}{4}$:$E\frac{1}{2}NE\frac{1}{4}$	160.00	Steeply rolling to rough	13	1	60/VI:100/VIII	1	Private

- Continued

Table 19.- Description, Area, Classification, Suitability and Proposed Management of Unreserved Public Domain, by Counties Within the Little Missouri River Basin, Montana, North Dakota, South Dakota and Wyoming, 1955 - Continued

P. M. Montana Twp. South	Range East	Sec.	Subdivision	Acres	General Land Character	AUM's	Present Land Use 1/	Land Capability Classification 2/	Principal Suitability 1/	Proposed Management
Carter County										
4	61	12	W½NW¼:NE¼SW¼	120.00	Gently to steeply rolling	5	1	70/VI:50/VIII	1	Private
4	61	19	NW¼NW¼:W½SW¼:SW¼NE¼	160.00	Gently to steeply rolling	29	1	120/VI:40/VII	1	Private
4	61	20	NW¼:NE¼SE¼	200.00	Steeply rolling to rough	28	1	VII	1	Private
4	61	21	NW¼NW¼	40.00	Gently sloping to rolling	9	1	25/IV:15/VII	1	Private
4	61	29	SW¼NW¼	40.00	Steeply rolling to rough	7	1	VII	1	Private
4	61	30	S½NE¼:N½SE¼	160.00	Steeply rolling to rough	22	1	VII	1	Private
4	62	17	NW¼SE¼	40.00	Gently to steeply rolling	14	1	IV	1	Private
4	62	29	SW¼SW¼	40.00	Steeply rolling to rough	5	1	VI	1	Private
4	62	30	SE¼SE¼; Lot 4	78.17	Steeply rolling to broken	13	1	VI	1	Private
5	57	22	NE¼NE¼	40.00	Gently sloping to rolling	8	1	25/IV:15/VI	1	Private
5	57	23	SE¼SW¼	40.00	Gently to steeply rolling	6	1	IV	1	Private
5	57	26	SW¼NE¼	40.00	Steeply rolling to rough	6	1	VI	1	Private
5	57	25	S½SE¼	80.00	Gently to steeply rolling	13	1	VI	1	Private
5	57	33	NW¼SW¼	40.00	Gently sloping to rolling	14	1	8/IV:32/VI	1	Private
5	58	1	Lot 3	40.06	Rolling to sloping, gently	4	1	VI	1	Private
5	58	4	Lot 2. S½NE¼	120.10	Gently sloping to rolling	29	1	47.10/IV:73/VI	1	Private
5	58	9	NE¼NW¼	40.00	Level to gently sloping	7	1	VI	1	Private
5	58	10	SW¼SE¼	40.00	Level to gently rolling	15	1	IV	1	Private
5	58	11	SW¼NW¼:NW¼SW¼	80.00	Level to gently rolling	10	1	IV	1	Private
5	58	14	NW¼NE¼	40.00	Gently sloping to rolling	5	1	IV	1	Private
5	58	15	NW¼NW¼:NE¼NE¼:S½NW¼: SW¼SW¼	200.00	Gently to steeply rolling	32	1	IV	1	Private
5	58	21	SE¼SE¼	40.00	Gently rolling	26	1	IV	1	Private
5	58	22	SE¼NE¼:SE¼NW¼:NE¼SW¼	120.00	Gently sloping to rolling	22	1	105/IV:15/VI	1	Private
5	58	27	E½W½	160.00	Gently to steeply rolling	32	1	IV	1	Private
5	58	28	NE¼NW¼	40.00	Gently to steeply rolling	6	1	IV	1	Private
5	58	29	NE¼NE¼	40.00	Gently to steeply rolling	6	1	VI	1	Private

- Continued

Table 19. - Description, Area, Classification, Suitability and Proposed Management of Unreserved Public Domain, by Counties Within the Little Missouri River Basin, Montana, North Dakota, South Dakota and Wyoming, 1955 - Continued

P. M. Montana Twp. South	Range East	Sec.	Subdivision	Acres	General Land Character	AUM's	Present Land Use 1/	Land Capability Classification 2/	Principal Suitability 1/	Proposed Management
Carter County										
5	58	30	Lot 4, $SE\frac{1}{4}SW\frac{1}{4}$	79.35	Gently to steeply rolling	13	1	VI	1	Private
5	61	11	$NE\frac{1}{4}SE\frac{1}{4}$	40.00	Steeply rolling to broken	6	1	VII	1	Private
5	61	14	$NE\frac{1}{4}NE\frac{1}{4}$:$SW\frac{1}{4}SE\frac{1}{4}$	80.00	Steeply rolling to rough	12	1	VI	1	Private
5	61	15	$W\frac{1}{2}NE\frac{1}{4}$:$NW\frac{1}{4}SE\frac{1}{4}$	120.00	Steeply rolling to rough	19	1	VI	1	Private
5	62	8	$E\frac{1}{2}SE\frac{1}{4}$:$S\frac{1}{2}SW\frac{1}{4}$	160.00	Steeply rolling to rough	32	1	VI	1	Private
5	62	18	$SW\frac{1}{4}NE\frac{1}{4}$	40.00	Gently to steeply rolling	8	1	VI	1	Private
5	62	32	$SW\frac{1}{4}SW\frac{1}{4}$	40.00	Gently to steeply rolling	8	1	VI	1	Private
6	55	25	$SE\frac{1}{4}SE\frac{1}{4}$	40.00	Gently rolling	13	1	IV	1	Private
6	56	11	$NW\frac{1}{4}NW\frac{1}{4}$:$SE\frac{1}{4}NW\frac{1}{4}$	80.00	Gently to steeply rolling	20	1	VI	1	Private
6	56	11	$SW\frac{1}{4}NW\frac{1}{4}$:$N\frac{1}{2}SW\frac{1}{4}$:$SE\frac{1}{4}SW\frac{1}{4}$: $NW\frac{1}{4}SE\frac{1}{4}$	200.00	Gently sloping to rolling	49	4	10/IV:122/VI:68/VIII	4	Federal
6	56	15	$W\frac{1}{2}SW\frac{1}{4}$	80.00	Gently to steeply rolling	18	1	VI	1	Private
6	56	28	$N\frac{1}{2}SE\frac{1}{4}$	80.00	Gently to steeply rolling	18	1	VI	1	Private
6	56	34	$SE\frac{1}{4}SW\frac{1}{4}$:$W\frac{1}{2}SE\frac{1}{4}$	120.00	Steeply rolling to rough	22	1	VI	1	Private
6	56	35	$E\frac{1}{2}$; $E\frac{1}{2}NW\frac{1}{4}$	400.00	Steeply rolling to rough	70	1	315/VI:85/VII	1	Private
6	57	1	$SW\frac{1}{4}SE\frac{1}{4}$	40.00	Gently to steeply rolling	9	1	IV	1	Private
6	57	2	Lots 1, 2, 3, 4. $NW\frac{1}{4}SE\frac{1}{4}$: $SW\frac{1}{4}SW\frac{1}{4}$	276.61	Gently to steeply rolling	72	1	VI	1	Private
6	57	3	Lots 1, 2, 7, 8, 9, 10:$SE\frac{1}{4}$	420.16	Gently to steeply rolling	76	1	VI	1	Private
6	57	7	Lot 4	34.37	Gently to steeply rolling	9	1	VI	1	Private
6	57	8	$SE\frac{1}{4}NW\frac{1}{4}$	40.00	Gently to steeply rolling	10	1	VI	1	Private
6	57	9	$S\frac{1}{2}NW\frac{1}{4}$	80.00	Gently to steeply rolling	19	1	VI	1	Private
6	57	10	$N\frac{1}{2}NE\frac{1}{4}$	80.00	Steeply rolling to rough	14	1	VI	1	Private
6	57	11	$NW\frac{1}{4}NW\frac{1}{4}$	40.00	Gently sloping to rolling	7	1	VI	1	Private
6	59	5	Lot 4	52.74	Gently to moderately rolling	11	1	VI	1	Private
6	59	6	Lot 6	40.00	Gently to moderately rolling	8	1	VI	1	Private
6	59	11	$N\frac{1}{2}SE\frac{1}{4}$:$SW\frac{1}{4}SE\frac{1}{4}$	120.00	Gently to steeply rolling	22	1	VI	1	Private

- Continued

Table 19.- Description, Area, Classification, Suitability and Proposed Management of Unreserved Public Domain, by Counties Within the Little Missouri River Basin, Montana, North Dakota, South Dakota and Wyoming, 1955 - Continued

P. M. Montana Twp. South	Range East	Sec.	Subdivision	Acres	General Land Character	AUM's	Present Land Use 1/	Land Capability Classification 2/	Principal Suitability 1/	Proposed Management
Carter County										
6	59	21	$SW\frac{1}{4}SE\frac{1}{4}$	40.00	Gently to steeply rolling	5	1	VI	1	Private
6	59	28	$NW\frac{1}{4}NE\frac{1}{4}$	40.00	Gently to steeply rolling	5	1	VI	1	Private
6	60	17	$SW\frac{1}{4}NW\frac{1}{4}$	40.00	Gently to steeply rolling	9	1	15/VI:25/VII	1	Private
6	60	21	$SW\frac{1}{4}SW\frac{1}{4}$	40.00	Steeply rolling	9	1	VI	1	Private
6	60	33	$S\frac{1}{2}SE\frac{1}{4}$:$W\frac{1}{2}SW\frac{1}{4}$	160.00	Gently rolling	30	1	VI	1	Private
6	62	1	$SW\frac{1}{4}NE\frac{1}{4}$	40.00	Sloping to gently rolling	8	1	VI	1	Private
6	62	2	Lot 4	40.18	Sloping to gently rolling	8	1	VI	1	Private
6	62	10	$NE\frac{1}{4}NE\frac{1}{4}$:$S\frac{1}{2}NE\frac{1}{4}$	120.00	Gently to steeply rolling	17	1	VI	1	Private
6	62	13	$SE\frac{1}{4}NE\frac{1}{4}$:$S\frac{1}{2}SE\frac{1}{4}$	120.00	Gently rolling to rough	20	1	VI	1	Private
6	62	21	$SE\frac{1}{4}SE\frac{1}{4}$	40.00	Gently rolling to level	10	1	20/IV:20/VI	1-2	Private
6	62	23	$SE\frac{1}{4}SW\frac{1}{4}$	40.00	Level to steep, broken	16	1-2	5/IV:35/VI	1-2	Private
6	62	24	$N\frac{1}{2}NE\frac{1}{4}$	80.00	Gently to steeply rolling	13	1	VI	1	Private
6	62	26	$NE\frac{1}{4}NW\frac{1}{4}$	40.00	Level to undulating	132	1-2	IV	1-2	Private
6	62	27	$E\frac{1}{2}SE\frac{1}{4}$	80.00	Gently to steeply rolling	13	1	VI	1	Private
6	62	33	$SE\frac{1}{4}NE\frac{1}{4}$:$NE\frac{1}{4}SE\frac{1}{4}$:$SW\frac{1}{4}NW\frac{1}{4}$:$SW\frac{1}{4}$	280.00	Gently to steeply rolling	52	1	VI	1	Private
6	63	19	$SE\frac{1}{4}NW\frac{1}{4}$:$SW\frac{1}{4}NE\frac{1}{4}$:$E\frac{1}{2}SW\frac{1}{4}$:$W\frac{1}{2}SE\frac{1}{4}$	240.00	Gently sloping to rolling	43	1	VI	1	Private
6	63	30	$N\frac{1}{2}NW\frac{1}{4}$:$NW\frac{1}{4}NE\frac{1}{4}$	120.00	Gently to steeply rolling	16	1	VI	1	Private
7	56	2	Lots 1, 2, 3. $SE\frac{1}{4}NW\frac{1}{4}$:$S\frac{1}{2}NE\frac{1}{4}$	239.97	Rolling to broken, rough	62	1	VII	1	Private
7	56	4	$SW\frac{1}{4}SW\frac{1}{4}$	40.00	Sloping to gently rolling	11	1	IV	1	Private
7	56	5	$NE\frac{1}{4}SE\frac{1}{4}$	40.00	Sloping to gently rolling	11	1	IV	1	Private
7	56	10	$E\frac{1}{2}NE\frac{1}{4}$	80.00	Steeply rolling to rough	22	1	VII	1	Private
7	56	20	$E\frac{1}{2}SW\frac{1}{4}$	80.00	Gently to steeply rolling	23	1	VI	1	Private
7	56	33	$W\frac{1}{2}$:$W\frac{1}{2}E\frac{1}{2}$	480.00	Sloping to rolling, broken	110	1	VI	1	Private
7	56	35	$NE\frac{1}{4}NW\frac{1}{4}$	40.00	Gently to steeply rolling	9	1	VI	1	Private
7	61	1	$SW\frac{1}{4}NE\frac{1}{4}$	40.00	Sloping to gently rolling	7	1	VI	1	Private

- Continued

Table 19.- Description, Area, Classification, Suitability and Proposed Management of Unreserved Public Domain, by Counties Within the Little Missouri River Basin, Montana, North Dakota, South Dakota and Wyoming, 1955 - Continued

P. M. Montana Twp. South	Range East	Sec.	Subdivision	Acres	General Land Character	AUM's	Present Land Use 1/	Land Capability Classification 2/	Principal Suitability 1/	Proposed Management
Carter County										
7	61	2	$SW\frac{1}{4}NE\frac{1}{4}$	40.00	Gently sloping, rolling	6	1	VI	1	Private
7	61	3	$S\frac{1}{2}NW\frac{1}{4}$	80.00	Gently sloping, rolling	20	1	IV	1	Private
7	61	10	$SW\frac{1}{4}NE\frac{1}{4}$	40.00	Gently sloping, rolling	5	1	IV	1	Private
7	61	11	$NW\frac{1}{4}SE\frac{1}{4}$	40.00	Gently sloping, rolling	6	1	VI	1	Private
7	61	12	$NE\frac{1}{4}SW\frac{1}{4}$	40.00	Gently sloping, rolling	7	1	VI	1	Private
7	61	13	$E\frac{1}{2}$	320.00	Gently to steeply rolling	47	1	VI	1	Private
7	61	14	$E\frac{1}{2}SW\frac{1}{4}$	80.00	Steeply rolling to rough	11	1	VI	1	Private
7	61	23	$NE\frac{1}{4}SE\frac{1}{4}$	40.00	Gently rolling	6	1	VI	1	Private
7	61	24	$NW\frac{1}{4}SW\frac{1}{4}$	40.00	Gently rolling	6	1	VI	1	Private
7	61	25	$SW\frac{1}{4}NW\frac{1}{4}$	40.00	Steeply rolling to rough	6	1	VI	1	Private
7	61	26	$SE\frac{1}{4}NE\frac{1}{4}$:$W\frac{1}{2}E\frac{1}{2}$:$W\frac{1}{2}$	520.00	Gently to steeply rolling	72	1	VI	1	Private
7	61	27	$SE\frac{1}{4}$	160.00	Gently rolling to broken	22	1	VI	1	Private
7	61	35	$N\frac{1}{2}$	320.00	Gently rolling to broken	31	1	VI	1	Private
7	62	18	Lot 4	34.90	Gently rolling, shale banks	6	1	VI	1	Private
7	62	19	Lots 1, 2, 3, 4. $E\frac{1}{2}W\frac{1}{2}$	300.60	Gently to steeply rolling	33	1	VI	1	Private
7	62	20	$SE\frac{1}{4}NW\frac{1}{4}$	40.00	Gently rolling to sloping	4	1	VI	1	Private
8	55	27	$SE\frac{1}{4}SW\frac{1}{4}$	40.00	Gently to steeply rolling	10	1	VI	1	Private
8	56	1	Lot 4	39.96	Undulating to rolling	15	1	IV	1	Private
8	56	6	$NE\frac{1}{4}SW\frac{1}{4}$:$NE\frac{1}{4}SE\frac{1}{4}$	80.00	Gently to steeply rolling	15	1	40/ VI:40/ VII	1	Private
8	56	7	$NW\frac{1}{4}SE\frac{1}{4}$	40.00	Gently rolling, broken	10	1	VI	1	Private
8	56	15	$W\frac{1}{2}NW\frac{1}{4}$:$NW\frac{1}{4}SW\frac{1}{4}$	120.00	Gently to steeply rolling	29	1	VI	1	Private
8	56	17	$S\frac{1}{2}SE\frac{1}{4}$	80.00	Gently to steeply rolling	18	1	VI	1	Private
8	56	19	Lots 1, 2, 3, 4. $E\frac{1}{2}W\frac{1}{2}$:$W\frac{1}{2}SE\frac{1}{4}$	389.28	Steeply rolling to rough	35	1	VII	1	Private
8	56	22	$NE\frac{1}{4}NW\frac{1}{4}$:$NW\frac{1}{4}NE\frac{1}{4}$	80.00	Gently to steeply rolling	20	1	VI	1	Private
8	56	25	$SE\frac{1}{4}NE\frac{1}{4}$:$NE\frac{1}{4}SE\frac{1}{4}$	80.00	Gently sloping to rolling	7	1	VII	1	Private
8	56	26	$S\frac{1}{2}N\frac{1}{2}$:$N\frac{1}{2}SW\frac{1}{4}$:$SE\frac{1}{4}SW\frac{1}{4}$	280.00	Gently to steeply rolling	70	1	VI	1	Private
8	56	27	$NE\frac{1}{4}$:$NE\frac{1}{4}SE\frac{1}{4}$	200.00	Gently to steeply rolling	50	1	VI	1	Private
8	56	30	$W\frac{1}{2}NE\frac{1}{4}$	80.00	Steeply rolling to rough	7	1	VII	1	Private
8	56	31	$NE\frac{1}{4}$	160.00	Steeply rolling to broken	40	1	VI	1	Private

- Continued

Table 19.- Description, Area, Classification, Suitability and Proposed Management of Unreserved Public Domain, by Counties Within the Little Missouri River Basin, Montana, North Dakota, South Dakota and Wyoming, 1955 - Continued

P. M. Montana Twp. South	Range East	Sec.	Subdivision	Acres	General Land Character	AUM's	Present Land Use 1/	Land Capability Classification 2/	Principal Suitability 1/	Proposed Management
Carter County										
8	56	32	SW¼:N½NE¼	240.00	Steeply rolling to rough	43	1	VI	1	Private
8	56	33	N½NW¼:NW¼NE¼:NE¼SE¼	160.00	Steeply rolling, rough	37	1	VI	1	Private
8	56	34	N½SE¼	80.00	Gently rolling	20	1	VI	1	Private
8	56	35	E½NW¼:NW¼SE¼	120.00	Gently sloping to rolling	30	1	VI	1	Private
8	57	8	SW¼SW¼	40.00	Sloping to gently rolling	8	1	VI	1	Private
8	57	10	SE¼NE¼:N½S½:SW¼SW¼:SE¼SE¼	280.00	Gently to steeply rolling	28	1	VI	1	Private
8	57	11	SE¼SW¼	40.00	Gently rolling, sloping	5	1	VI	1	Private
8	57	18	SE¼SW¼:S½SE¼	120.00	Gently to steeply rolling	12	1	VII	1	Private
8	57	19	NE¼:N½SE¼	240.00	Steeply rolling, rough	24	1	VII	1	Private
8	57	20	NW¼:N½SW¼:N½NE¼	320.00	Gently to steeply rolling	36	1	70/VI:250/VII	1	Private
8	57	23	NW¼NE¼	40.00	Sloping to gently rolling	3	1	VI	1	Private
8	57	24	NW¼SE¼	40.00	Gently rolling, undulating	6	1	VI	1	Private
8	58	15	NE¼SE¼	40.00	Gently rolling	6	1	VI	1	Private
8	58	17	NE¼NE¼:S½SW¼	120.00	Gently rolling to flat	27	1	VI	1	Private
8	58	18	SE¼SE¼	40.00	Gently rolling to flat	11	1	VI	1	Private
8	58	20	W½NE¼:NW¼SE¼:NE¼NW¼: SW¼SW¼	200.00	Gently rolling to flat	43	1	VI	1	Private
8	58	21	SE¼NW¼:NE¼SW¼	80.00	Gently rolling to flat	20	1	VI	1	Private
8	58	22	NW¼NE¼	40.00	Gently rolling	10	1	VI	1	Private
8	58	27	NW¼NE¼:NE¼NW¼	80.00	Gently rolling to flat	12	1	VI	1	Private
8	59	15	E½W½	160.00	Gently rolling	27	1	VI	1	Private
8	59	22	SE¼SW¼:S½SE¼	120.00	Gently rolling	17	1	VI	1	Private
8	59	33	Lot 4	39.29	Gently rolling	8	1	VI	1	Private
8	60	9	S½NE¼:SE¼:SE¼NW¼	280.00	Gently to moderately rolling	51	1	VI	1	Private
8	60	10	W½SW¼	80.00	Gently to moderately rolling	18	1	VI	1	Private
8	60	13	E½NE¼	80.00	Gently to steeply rolling	10	1	VI	1	Private
8	60	22	S½NE¼:N½SE¼:SE¼NW¼: N½ SW¼	280.00	Undulating to rolling	57	1	VI	1	Private

- Continued

Table 19. - Description, Area, Classification, Suitability and Proposed Management of Unreserved Public Domain, by Counties Within the Little Missouri River Basin, Montana, N rth Dakota, South Dakota and Wyoming, 1955 - Continued

P. M. Montana Twp. South	Range East	Sec.	Subdivision	Acres	General Land Character	AUM's	Present Land Use 1/	Land Capability Classification 2/	Principal Suitability 1/	Proposed Management
Carter County										
8	60	23	SW¼NW¼:W½SW¼:SE¼SW¼	160.00	Undulating to rolling	48	1	VI	1	Private
8	60	26	W½NW¼	80.00	Undulating to rolling	4	1	VI	1	Private
8	61	9	NE¼SE¼	40.00	Undulating to gently rolling	8	1	VI	1	Private
8	61	15	NW¼NE¼:SW¼NW¼	80.00	Rolling to undulating	14	1	VI	1	Private
8	61	18	NW¼NE¼	40.00	Gently to steeply rolling	5	1	VI	1	Private
8	61	19	Lots 1, 2, 3, 4	66.39	Gently to steeply rolling	15	1	VI	1	Private
8	61	30	Lots 1, 2, 3, 4	49.77	Gently to steeply rolling	11	1	VI	1	Private
8	61	32	NW¼	160.00	Gently to steeply rolling	37	1	VI	1	Private
8	61	34	SE¼SE¼	40.00	Gently rolling, undulating	8	1	VI	1	Private
8	61	35	NW¼SW¼	40.00	Gently rolling, undulating	8	1	VI	1	Private
9	55	1	W½NE¼	80.00	Gently to steeply rolling	16	1	VI	1	Private
9	55	2	NW¼SW¼	40.00	Gently rolling, undulating	6	1	VI	1	Private
9	55	6	NE¼SE¼	40.00	Gently rolling to steep	8	1	VII	1	Private
9	55	7	SE¼SE¼	40.00	Gently to steeply rolling	8	1	VII	1	Private
9	55	8	SW¼SW¼:SE¼SE¼	80.00	Gently rolling, sloping	16	1	VI	1	Private
9	55	9	SE¼SE¼	40.00	Gently rolling, undulating	14	1	IV	1	Private
9	55	10	N½SE¼	80.00	Gently to steeply rolling	17	1	VI	1	Private
9	55	11	NW¼SW¼	40.00	Gently to steeply rolling	9	1	VI	1	Private
9	55	15	NW¼SE¼	40.00	Steeply rolling, rough	5	1	VII	1	Private
9	55	18	Lot 2, SW¼NE¼:NE¼SE¼	117.39	Gently to steeply rolling	25	1	40/IV:77.39/VI	1	Private
9	55	20	NW¼SW¼	40.00	Gently sloping, undulating	14	1	IV	1	Private
9	55	21	N½NE¼	80.00	Undulating to gently rolling	21	1	40/IV:40/VI	1	Private
9	55	22	NW¼NW¼	40.00	Gently to steeply rolling	8	1	VI	1	Private
9	55	28	SW¼SE¼	40.00	Gently to steeply rolling	10	1	VI	1	Private
9	55	30	Lot 2	37.61	Steeply rolling, rough	9	1	VII	1	Private
9	55	32	Lots 10, 12	92.09	Gently sloping to rolling	29	1	46.06/IV:46.03/VII	1	Private
9	56	2	SE¼SE¼	40.00	Gently to steeply rolling	10	1	VI	1	Private

- Continued

Table 19. - Description, Area, Classification, Suitability and Proposed Management of Unreserved Public Domain, by Counties Within the Little Missouri River Basin, Montana, North Dakota, South Dakota and Wyoming, 1955 - Continued

P. M. Montana Twp. South	Range East	Sec.	Subdivision	Acres	General Land Character	AUM's	Present Land Use 1/	Land Capability Classification 2/	Principal Suitability 1/	Proposed Management
Carter County										
9	56	5	NW¼NW¼:W½SW¼	120.00	Gently to steeply rolling	23	1	VI	1	Private
9	59	2	SE¼:E½SW¼	240.00	Gently sloping	22	1	VI	1	Private
9	59	3	SE¼NW¼:NE¼SW¼	80.00	Gently sloping	16	1	VI	1	Private
9	59	10	S½NE¼;SE¼NW¼:SW¼SW¼:E½ SW¼:SE¼	400.00	Gently to steeply rolling	80	1	320/VI:80/VII	1	Private
9	59	11	SW¼SW¼:N½SW¼:S½NW¼: NE¼NW¼:NE¼	400.00	Gently to steeply rolling	120	1	160/VI:240/VII	1	Private
9	59	14	NW¼NW¼	40.00	Gently to steeply rolling	7	1	35/VI:5/VII	1	Private
9	59	15	N½N½	160.00	Gently to steeply rolling	22	1	VI	1	Private
9	59	22	S½SE¼	80.00	Gently to steeply rolling	11	1	VI	1	Private
9	59	23	SW¼SW¼:E½W½:E½	520.00	Gently to steeply rolling	73	1	VI	1	Private
9	59	24	SW¼SW¼:N½SW¼, NW¼	280.00	Gently to steeply rolling	40	1	VI	1	Private
9	59	25	NW¼NW¼	40.00	Gently to steeply rolling	6	1	VI	1	Private
9	59	26	N½NE¼:NW¼	240.00	Gently to steeply rolling	34	1	VI	1	Private
9	59	27	NE¼SE¼:NE¼	200.00	Gently to steeply rolling	14	1	VII	1	Private
9	59	32	SW¼SE¼	40.00	Gently to steeply rolling	6	1	VI	1	Private
9	59	33	N½NW¼:NE¼NE¼:SE¼SW¼: SW¼SE¼	200.00	Gently to steeply rolling	31	1	110/VI:90/VII	1	Private
9	59	35	N½NE¼	80.00	Gently to steeply rolling	6	1	VII	1	Private
9	60	1	Lot 5	37.19	Gently rolling to rough	6	1	VI	1	Private
9	60	2	E½SE¼	80.00	Gently to steeply rolling	14	1	65/VI:15/VII	1	Private
9	60	12	SW¼NE¼:S½NW¼:NE¼SW¼: N½SE¼	240.00	Gently to steeply rolling	32	1	145/VI:95/VII	1	Private
9	60	13	Lots 1, 2	72.79	Gently to steeply rolling	13	1	VI	1	Private
9	60	14	Lots 1, 2, 3	99.03	Gently to steeply rolling	16	1	VI	1	Private
9	60	21	W½NE¼	80.00	Steeply rolling, rough	11	1	VII	1	Private

- Continued

Table 19.- Description, Area, Classification, Suitability and Proposed Management of Unreserved Public Domain, by Counties Within the Little Missouri River Basin, Montana, North Dakota, South Dakota and Wyoming, 1955 - Continued

P. M. Montana Twp. South	Range East	Sec.	Subdivision	Acres	General Land Character	AUM's	Present Land Use 1/	Land Capability Classification 2/	Principal Suitability 1/	Proposed Management
Carter County										
9	60	24	NW¼:NE¼SW¼	200.00	Gently to steeply rolling	32	1	VI	1	Private
9	60	31	Lot 1	40.22	Bottom land	10	1	VI	3	Municipal
9	60	32	SE¼NW¼	40.00	Flat		2	IV	2	Private
9	60	34	SE¼NW¼	40.00	Gently rolling	10	1	VI	1	Private
9	61	1	NW¼NW¼:SE¼NW¼:NW¼SE¼	120.00	Sloping to gently rolling	37	1	IV	1	Private
9	61	2	SW¼NE¼:S½SW¼	120.00	Sloping to gently rolling	29	1	IV	1	Private
9	61	3	SE¼SE¼:E½SW¼	120.00	Gently to steeply rolling	28	1	IV	1	Private
9	61	4	E½NE¼	80.00	Gently to steeply rolling	10	1	VI	1	Private
9	61	18	Lots 3, 4:S½SE¼:NW¼SE¼	175.88	Rolling to steep & broken	26	1	110/VI:65.88/VII	1	Private
North										
1	57	11	W½NE¼:NE¼NW¼:NW¼SE¼	160.00	Gently to steeply rolling	52	1	25/IV:65/VI:70/VII	1	Private
1	57	13	Lots 1, 6, 7, 12: NE¼SW¼	131.00	Gently to steeply rolling	35	1	102.81/VI:28.19/VII	1	Private
1	57	24	SE¼NW¼	40.00	Gently to steeply rolling	10	1	15/VI:25/VII	1	Private
1	58	3	W½SW¼	80.00	Steeply rolling to rough	22	1	VI	1	Private
1	58	9	SE¼NW¼	40.00	Gently sloping, undulating	15	1	IV	1	Private
1	58	10	NE¼NW¼:NW¼NE¼:SE¼NE¼	120.00	Steeply rolling to rough	20	1	80/VI:40/VIII	1	Private
1	58	25	NE¼NE¼:NE¼SE¼:S½SE¼:SW¼	320.00	Gently to steeply rolling	63	1	210/VI:55/VII:55/VIII	1	Private
1	59	1	SE¼NE¼:N½SE¼:SE¼SE¼	160.00	Gently to steeply rolling	30	1	VI	1	Private
1	59	2	SE¼NE¼:S½SW¼:SW¼SE¼	160.00	Gently to steeply rolling	42	1	VI	1	Private
1	59	3	NE¼SE¼	40.00	Gently to steeply rolling	10	1	VI	1	Private
1	59	12	E½SE¼	80.00	Gently to steeply rolling	18	1	VI	1	Private
1	59	13	SW¼	160.00	Gently to steeply rolling	42	1	VI	1	Private
1	59	14	NW¼SE¼	40.00	Steeply rolling to rough	8	1	VI	1	Private
1	59	15	NE¼NE¼	40.00	Gently to steeply rolling	9	1	VI	1	Private

- Continued

Table 19.- Description, Area, Classification, Suitability and Proposed Management of Unreserved Public Domain, by Counties Within the Little Missouri River Basin, Montana, North Dakota, South Dakota and Wyoming, 1955 - Continued

P. M. Montana Twp. North	Range East	Sec.	Subdivision	Acres	General Land Character	AUM's	Present Land Use 1/	Land Capability Classification 2/	Principal Suitability 1/	Proposed Management
Carter County										
1	59	18	$SW\frac{1}{4}NE\frac{1}{4}$	40.00	Gently rolling, undulating	12	1	VI	1	Private
1	59	18	$W\frac{1}{2}SE\frac{1}{4}$	80.00	Gently to steeply rolling	22	1	VI	1	Private
1	59	20	$SE\frac{1}{4}NW\frac{1}{4}$:$S\frac{1}{2}SE\frac{1}{4}$	120.00	Gently rolling to undulating	24	1	40/VI:80/VII	1	Private
1	59	29	$NE\frac{1}{4}SW\frac{1}{4}$	40.00	Gently to steeply rolling	10	1	VI	1	Private
1	59	30	Lots 1 and 2	79.39	Steeply rolling to rough	14	1	15/VI:45/VII 19.39/VIII	1	Private
1	59	31	$SE\frac{1}{4}NE\frac{1}{4}$	40.00	Gently to steeply rolling	8	1	VI	1	Private
1	59	32	$SE\frac{1}{4}NW\frac{1}{4}$:$SW\frac{1}{4}NE\frac{1}{4}$:$N\frac{1}{2}SE\frac{1}{4}$	160.00	Gently rolling, undulating	51	1	VI	1	Private
1	60	6	Lot 5	27.67	Gently to steeply rolling	8	1	VI	1	Private
1	60	18	Lots 3, 4, 5, 6, 9, 10	149.92	Gently to steeply rolling	39	1	VI	1	Private
1	60	25	$SE\frac{1}{4}$	160.00	Steeply rolling to rough	40	1	VII	1	Private
1	60	26	$SW\frac{1}{4}NE\frac{1}{4}$:$NW\frac{1}{4}SE\frac{1}{4}$	80.00	Steeply rolling to undulated	18	1	40/VI:40/VII	1	Private
1	60	34	$SW\frac{1}{4}$	160.00	Steeply rolling, rough	22	1	100/VII:60/VIII	1	Private
1	61	11	$NW\frac{1}{4}NW\frac{1}{4}$:$SE\frac{1}{4}SW\frac{1}{4}$	80.00	Gently rolling, undulating	26	1	40/V:40/VI	1	Private
1	61	12	$E\frac{1}{2}SW\frac{1}{4}$	80.00	Gently to steeply rolling	24	1	VI	1	Private
1	61	14	$NE\frac{1}{4}NW\frac{1}{4}$:$NW\frac{1}{4}NE\frac{1}{4}$	80.00	Gently to steeply rolling	21	1	VI	1	Private
1	61	23	$SW\frac{1}{4}NE\frac{1}{4}$	40.00	Steeply rolling to rough	8	1	VII	1	Private
1	61	24	$SW\frac{1}{4}NE\frac{1}{4}$:$SE\frac{1}{4}$	200.00	Gently to steeply rolling	54	1	VI	1	Private
1	61	25	$N\frac{1}{2}NE\frac{1}{4}$:$SE\frac{1}{4}NE\frac{1}{4}$	120.00	Gently to steeply rolling	32	1	VI	1	Private
1	61	18	$NE\frac{1}{4}SE\frac{1}{4}$:$SE\frac{1}{4}SW\frac{1}{4}$	80.00	Steeply rolling to rough	21	1	VI	1	Private
1	61	19	$E\frac{1}{2}NW\frac{1}{4}$:$NW\frac{1}{4}NE\frac{1}{4}$	120.00	Gently to steeply rolling	31	1	VI	1	Private
1	61	20	$SW\frac{1}{4}NE\frac{1}{4}$:$W\frac{1}{2}SE\frac{1}{4}$	120.00	Steeply rolling, mountainous	30	1	VI	1	Private
1	61	28	$W\frac{1}{2}SW\frac{1}{4}$	80.00	Gently to steeply rolling	18	1	VI	1	Private
1	61	29	$E\frac{1}{2}$:$E\frac{1}{2}SW\frac{1}{4}$	400.00	Steeply rolling, rough	72	1	VII	1	Private
1	61	32	$S\frac{1}{2}$	320.00	Steeply rolling to rough	58	1	VII	1	Private
1	61	33	$NW\frac{1}{4}NW\frac{1}{4}$:$S\frac{1}{2}NW\frac{1}{4}$:$W\frac{1}{2}SE\frac{1}{4}$:$SW\frac{1}{4}$	360.00	Steeply rolling, broken	65	1	VII	1	Private
1	62	8	Lot 4	23.32	Steeply rolling to rough	5	1	VII	1	Private
1	62	17	Lot 4	25.47	Steeply rolling to rough	6	1	VII	1	Private

- Continued

Table 19.- Description, Area, Classification, Suitability and Proposed Management of Unreserved Public Domain, by Counties Within the Little Missouri River Basin, Montana, North Dakota, South Dakota and Wyoming, 1955 - Continued

P. M. Montana Twp. North	Range East	Sec.	Subdivision	Acres	General Land Character	AUM's	Present Land Use 1/	Land Capability Classification 2/	Principal Suitability 1/	Proposed Management
Carter County										
1	62	19	NE¼:S½	480.00	Steeply broken thin breaks	77	1	VII	1	Private
1	62	20	All	265.16	Steeply broken thin breaks	53	1	VII	1	Private
1	62	29	All	269.20	Steeply rolling to rough	83	1	VI	1	Private
1	62	30	All	640.00	Steeply rolling to rough	173	1	VI	1	Private
1	62	31	N½NW¼	80.00	Gently to steeply rolling	22	1	VI	1	Private
1	62	32	All	273.24	Gently to steeply rolling	71	1	VI	1	Private
2	58	12	NW¼NE¼:SE¼NE¼:SE¼NW¼	120.00	Steeply rolling, steep cliffs	18	1	VII	1	Private
2	58	13	SW¼SE¼:S½SW¼	120.00	Steeply rolling, broken	22	1	VII	1	Private
2	58	14	NE¼NW¼	40.00	Gently to steeply rolling	9	1	VI	1	Private
2	58	17	NW¼SW¼	40.00	Gently sloping, undulating	14	1	IV	1	Private
2	59	1	SE¼:S½SW¼	240.00	Steeply rolling, thin breaks	41	1	VII	1	Private
2	59	2	S½SW¼	80.00	Gently rolling, undulating	18	1	VI	1	Private
2	59	7	Lot 2	38.60	Steeply rolling rough	6	1	VII	1	Private
2	59	12	NW¼NW¼:E½NW¼:NE¼:N½SE¼: NE¼SW¼	400.00	Steep, thin breaks, rough	72	1	VII	1	Private
2	59	13	N½N½:SE¼NE¼	200.00	Steep, broken shale hills	40	1	VII	1	Private
2	59	14	NW¼NE¼	40.00	Steep, broken rough hills	10	1	VII	1	Private
2	59	18	NE¼SW¼	40.00	Gently to steeply rolling	8	1	VI	1	Private
2	59	23	NE¼NE¼:NE¼SE¼	80.00	Gently to steeply rolling	19	1	VI	1	Private
2	59	24	N½NE¼:NE¼NW¼:NW¼SW¼	160.00	Gently to steeply rolling	24	1	VI	1	Private
2	59	26	NE¼NE¼:NE¼NW¼	80.00	Gently rolling, undulating	19	1	40/V:40/VI	1	Private
2	59	35	NE¼SE¼	40.00	Gently to steeply rolling	8	1	VI	1	Private
2	60	1	S½SW¼	80.00	Steeply rolling to rough	22	1	VI	1	Private
2	60	2	Lots 2, 3, 4:NW¼SW¼	129.17	Gently to steeply rolling	36	1	VI	1	Private
2	60	3	Lot 2:SW¼NE¼	69.69	Gently to steeply rolling	22	1	VI	1	Private
2	60	5	S½SW¼:SE¼SW¼	120.00	Gently to steeply rolling	26	1	VI	1	Private
2	60	6	Lot 8:W½SE¼:SW¼SE¼	160.00	Sand Hills and bluffs	40	1	VI	1	Private
2	60	7	Lots 1, 2, 3, 4, 5, 6, 9, 10, 11 NE¼:SE¼SW¼	583.72	Choppy sand hills, broken	121	1	VI	1	Private

- Continued

Table 19.- Description, Area, Classification, Suitability and Proposed Management of Unreserved Public Domain, by Counties Within the Little Missouri River Basin, Montana, North Dakota, South Dakota and Wyoming, 1955 - Continued

P. M. Montana Twp. North	Range East	Sec.	Subdivision	Acres	General Land Character	AUM's	Present Land Use 1/	Land Capability Classification 2/	Principal Suitability 1/	Proposed Management
Carter County										
2	60	8	NE¼:S½NE¼:N½SE¼	320.00	Choppy sand hills, broken	84	1	VI	1	Private
2	60	10	NW¼SE¼	40.00	Gently to steeply rolling	11	1	VI	1	Private
2	60	12	E½W½:S½NE¼:SE¼	400.00	Gently to steeply rolling	78	1	160/VI:240/VII	1	Private
2	60	13	NW¼SW¼	40.00	Gently rolling, undulating	8	1	VI	1	Private
2	60	14	N½SE¼:SE¼SE¼	120.00	Gently to steeply rolling	25	1	VI	1	Private
2	60	18	Lots 4, 5, 6, 8, 10, 11	285.33	Steeply rolling to broken	52	1	VII	1	Private
2	60	19	Lot 7, SW¼SE¼	80.00	Gently rolling, undulating	16	1	VI	1	Private
2	60	26	S½SE¼	80.00	Gently to steeply rolling	24	1	VI	1	Private
2	60	28	NE¼SE¼	40.00	Steeply rolling scoria hills	11	1	VI	1	Private
2	60	31	Lots 1, 11, 12	120.00	Gently to steeply rolling	31	1	VI	1	Private
2	61	18	Lots 1, 2. SE¼SE¼	114.10	Rolling scoria hills, rough	27	1	40/V:37.07/VI: 37.03/VII	1	Private
2	61	21	NE¼SW¼	40.00	Gradually undulating	12	1	V	1	Private
2	61	32	SW¼NE¼	40.00	Rough scoria hills	6	1	VII	1	Private
3	58	21	NE¼SW¼	40.00	Gently to steeply rolling	8	1	VII	1	Private
3	58	23	NW¼SW¼	40.00	Rolling to undulating	11	1	VI	1	Private
3	58	28	SW¼NE¼	40.00	Undulating, steeply sloping	10	1	VI	1	Private
3	58	33	SW¼SW¼	40.00	Steeply rolling rough	8	1	VII	1	Private
Fallon County										
2	61	10	NW¼SW¼	40.00	Gently rolling, hummocky	10	1	VI	1	Private
2	61	12	SW¼SW¼	40.00	Gently sloping, rolling	12	1	V	1	Private
2	61	23	NW¼SE¼	40.00	Steeply rolling to rough	8	1	VII	1	Private
2	62	18	NW¼SE¼	40.00	Gently to steeply rolling	11	1	VI	1	Private
2	62	20	Lot 1	52.74	Gently sloping to rolling	16	1	V	1	Private
2	62	31	S½NW¼:W½SE¼:SE¼SE¼	200.00	Gently sloping to rolling	64	1	80/V:120/VI	1	Private
2	62	32	Lots 3, 4	117.66	Gently sloping to rolling	36	1	VI	1	Private

- Continued

Table 19.- Description, Area, Classification, Suitability and Proposed Management of Unreserved Public Domain, by Counties Within the Little Missouri River Basin, Montana, North Dakota, South Dakota and Wyoming, 1955 - Continued

P. M. Montana Twp. North	Range East	Sec.	Subdivision	Acres	General Land Character	AUM's	Present Land Use 1/	Land Capability Classification 2/	Principal Suitability 1/	Proposed Management
Fallon County										
3	60	11	SW¼SE¼	40.00	Gently sloping to rolling	8	1	6/IV:34/VI	1	Private
3	60	13	N½NE¼	80.00	Gently to steeply rolling	16	1	VII	1	Private
3	60	18	SE¼NE¼	40.00	Gently sloping to rolling	11	1	VI	1	Private
3	60	21	NE¼NE¼	40.00	Gently sloping to rolling	13	1	VI	1	Private
3	61	7	Lots 3, 4, 5	142.41	Steeply rolling, hummocky	44	1	91.22/V:51.19/VII	1	Private
3	61	2	Lot 3:N½SW¼:SE¼SW¼	150.51	Gently sloping to rolling	38	1	VI	1	Private
3	61	3	Lot 1	30.62	Gently rolling to rough	6	1	VI	1	Private
3	61	9	NE¼NE¼:NW¼SW¼:S½SW¼:SW¼SE¼	200.00	Gently to steeply rolling	63	1	V	1	Private
3	61	11	SW¼NE¼:NW¼SE¼	80.00	Gently sloping to rolling	20	1	VI	1	Private
3	61	17	NW¼SW¼:S½SW¼	120.00	Gently to steeply rolling	38	1	VI	1	Private
3	61	18	Lots 7, 12:SE¼	240.00	Gently to steeply rolling	42	1	80/VI:120/VII:40/VIII	1	Private
3	61	19	Lot 12	40.00	Steeply rolling to rough	9	1	VII	1	Private
3	61	20	SW¼SW¼	40.00	Gently to steeply rolling	10	1	VI	1	Private
3	61	21	NE¼NE¼	40.00	Gently to steeply rolling	14	1	VI	1	Private
3	61	26	NW¼SE¼	40.00	Gently sloping to rolling	14	1	VI	1	Private
3	61	29	NW¼NW¼	40.00	Gently sloping to rolling	12	1	VI	1	Private
3	61	30	Lot 1	40.00	Gently sloping to rolling	10	1	VI	1	Private
3	61	35	SW¼SW¼	40.00	Steeply rolling to broken	9	1	VII	1	Private
3	62	17	Lot 4	38.68	Steeply rolling, broken	5	1	20/VII:18.68/VIII	1	Private
3	62	30	SW¼SE¼	40.00	Gently to steeply rolling	10	1	VI	1	Private
3	62	31	SW¼NE¼	40.00	Gently rolling to sloping	10	1	VI	1	Private
4	59	28	NE¼SW¼	40.00	Gently to steeply rolling	12	1	VI	1	Private
4	59	35	NE¼NW¼	40.00	Gently rolling to sloping	13	1	VI	1	Private
4	60	20	NE¼NE¼	40.00	Gently rolling, hummocky	10	1	VI	1	Private
5	60	24	NE¼SW¼	40.00	Gently to steeply rolling	12	1	VI	1	Private
5	60	26	NW¼SW¼	40.00	Gently rolling to sloping	14	1	IV	1	Private
5	60	27	SW¼SW¼:E½SW¼:W½SE¼	200.00	Gently rolling to sloping	13	2	160/IV:40/VI	2	Private

Table 19.- Description, Area, Classification, Suitability and Proposed Management of Unreserved Public Domain, by Counties Within the Little Missouri River Basin, Montana, North Dakota, South Dakota and Wyoming, 1955 - Continued

P. M. Montana Twp. North	Range East	Sec.	Subdivision	Acres	General Land Character	AUM's	Present Land Use 1/	Land Capability Classification 2/	Principal Suitability 1/	Proposed Management
Fallon County										
5	60	34	$SW\frac{1}{4}SW\frac{1}{4}$	40.00	Gently to steeply rolling	12	1	VI	1	Private
6	60	2	$E\frac{1}{2}:SW\frac{1}{4}$	480.00	Steeply rolling, rough	96	1	VI	1	Private
6	60	32	$N\frac{1}{2}NW\frac{1}{4}:E\frac{1}{2}NE\frac{1}{4}$	160.00	Undulating, sharp coulees	41	1	120/VI:40/VII	1	Private
6	61	14	Lot 4	49.55	Gently rolling	11	1	VI	1	Private
7	61	2	Lots 1, 2, 3	157.45	Thin breaks to badlands	20	1	VII	1	Private
7	61	10	$E\frac{1}{2}$	320.00	Thin breaks to badlands	62	1	VII	1	Private
8	60	12	$NW\frac{1}{4}$	160.00	Rough shaley knob	26	1	VII	1	Private
8	60	14	$N\frac{1}{2}NE\frac{1}{4}:NE\frac{1}{4}NW\frac{1}{4}:W\frac{1}{2}NE\frac{1}{4}:E\frac{1}{2}SE\frac{1}{4}$	280.00	Thin breaks to badlands	52	1	VII	1	Private
8	60	24	$W\frac{1}{2}W\frac{1}{2}$	160.00	Thin breaks to badlands	24	1	VII	1	Private
8	61	6	Lots 1, 2, 3, 4:$S\frac{1}{2}NE\frac{1}{4}:SE\frac{1}{4}:S\frac{1}{2}SW\frac{1}{4}$	440.23	Steeply rolling	74	1	400.4/VI:400.18/VII	1	Private
8	61	2	All	639.32	Thin breaks to rough badlands	83	1	VII	1	Private
8	61	4	All	640.40	Thin breaks to rough badlands	61	1	VII	1	Private
8	61	10	$N\frac{1}{2}$	320.00	Thin breaks to rough badlands	38	1	VII	1	Private
8	61	12	Lots 1, 2, 3, 4	117.48	Thin breaks to rough badlands	16	1	VII	1	Private
8	61	20	$W\frac{1}{2}NE\frac{1}{4}:E\frac{1}{2}NW\frac{1}{4}$	160.00	Thin breaks to badlands	19	1	VII	1	Private
8	61	22	All	640.00	Thin breaks to badlands	64	1	VII	1	Private
8	61	24	Lots 1, 2, 3, 4	115.20	Thin breaks to badlands	14	1	VII	1	Private
8	61	32	$S\frac{1}{2}NE\frac{1}{4}:E\frac{1}{2}SE\frac{1}{4}$	160.00	Thin breaks to badlands	22	1	VII	1	Private
9	60	26	$W\frac{1}{2}W\frac{1}{2}$	160.00	Gently to steeply rolling	46	1	VI	1	Private
9	60	34	$SW\frac{1}{4}NW\frac{1}{4}$	40.00	Thin breaks to badlands	6	1	VII	1	Private
9	61	32	$S\frac{1}{2}S\frac{1}{2}:NE\frac{1}{4}SE\frac{1}{4}:SE\frac{1}{4}NE\frac{1}{4}:N\frac{1}{2}NE\frac{1}{4}$	320.00	Thin breaks and badlands	65	1	80/VI:240/VII	1	Private
South East										
Powder River County										
9	54	13	$SE\frac{1}{4}SE\frac{1}{4}$	40.00	Sloping to gently rolling	8	1	IV	1	Private

- Continued

Table 19.- Description, Area, Classification, Suitability and Proposed Management of Unreserved Public Domain, by Counties Within the Little Missouri River Basin, Montana, North Dakota, South Dakota and Wyoming, 1955 - Continued

P. M. Montana Twp. South	Range East	Sec.	Subdivision	Acres	General Land Character	AUM's	Present Land Use 1/	Land Capability Classification 2/	Principal Suitability 1/	Proposed Management
Powder River County										
9	54	23	NE¼NE¼	40.00	Sloping to gently rolling	6	1	IV	1	Private
9	54	24	N½NW¼:NE¼NE¼:W½SE¼	200.00	Steeply rolling to rough	40	1	VII	1	Private
9	54	25	SE¼NE¼	40.00	Steeply rolling to rough	10	1	IV	1	Private
North East										
Wibaux County										
13	60	8	NW¼NE¼	40.00	Gently rolling to rough	12	1-2	10/III:30/VII	1	Private
16	60	14	E½NE¼	80.00	Steeply rolling to rough	19	1	VII	1	Private
16	60	34	SE¼SW¼:SW¼SE¼	80.00	Steeply rolling to rough	20	1	VII	1	Private
16	61	18	Lot 4	39.37	Steeply rolling to rough	10	1	VII	1	Private
North Dakota Fifth P. M. Twp. North	Range West									
Bowman County										
129	104	31	Lots 1, 3, 4	119.72	Rolling to undulating	34	1	24.90/VI:94.82/VII	1	Private
129	105	1	W½SW¼	80.00	Thin breaks to badlands	7	1	50/VII:30/VIII	1	Private
129	105	2	Lots 1, 2, 3, 4:S½NE¼:E½SE¼	320.32	Thin breaks to badlands	24	1	100/VII:220.32/VIII	1	Private
129	105	5	SE¼NW¼:SW¼SW¼:SE¼SE¼	120.00	Steeply rolling to rough	15	1	VII	1	Private
129	105	6	Lots 4, 5, 7	118.49	Steeply rolling to rough	15	1	VII	1	Private
129	105	8	NW¼NW¼:E½NW¼:NW¼NE¼	160.00	Steeply rolling to rough	22	1	VII	1	Private
129	105	11	N½NE¼	80.00	Thin breaks, rough broken	7	1	30/VII:50/VIII	1	Private

- Continued

Table 19.- Description, Area, Classification, Suitability and Proposed Management of Unreserved Public Domain, by Counties Within the Little Missouri River Basin, Montana, North Dakota, South Dakota and Wyoming, 1955 - Continued

Fifth P. M. Twp. North	Range West	Sec.	Subdivision	Acres	General Land Character	AUM's	Present Land Use 1/	Land Capability Classification 2/	Principal Suitability 1/	Proposed Management
Bowman County										
129	105	12	$N\frac{1}{2}NW\frac{1}{4}$:$SW\frac{1}{4}NW\frac{1}{4}$	120.00	Thin breaks, rough broken	10	1	50/VII:70/VIII	1	Private
129	105	14	$NW\frac{1}{4}NE\frac{1}{4}$:$E\frac{1}{2}NW\frac{1}{4}$:$SW\frac{1}{4}NW\frac{1}{4}$:$NE\frac{1}{4}SW\frac{1}{4}$	200.00	Thin breaks, rough broken	32	1	150/VII:50/VIII	1	Private
129	105	15	$NE\frac{1}{4}NE\frac{1}{4}$	40.00	Steeply rolling, undulating	12	1	VI	1	Private
129	105	23	$SE\frac{1}{4}SE\frac{1}{4}$	40.00	Steeply rolling to rough	8	1	20/VI:20/VII	1	Private
129	105	24	$NW\frac{1}{4}NW\frac{1}{4}$:$SW\frac{1}{4}NE\frac{1}{4}$:$SW\frac{1}{4}SE\frac{1}{4}$	120.00	Steeply rolling to rough	24	1	30/VI:60/VII:30/VIII	1	Private
129	105	25	$N\frac{1}{2}SW\frac{1}{4}$	80.00	Steeply rolling to rough	14	1	VII	1	Private
129	105	26	$NE\frac{1}{4}NE\frac{1}{4}$	40.00	Steeply rolling to rough	8	1	15/VI:25/VII	1	Private
129	105	29	$NE\frac{1}{4}NW\frac{1}{4}$	40.00	Thin breaks to badlands	4	1	15/VII:25/VIII	1	Private
129	105	35	$S\frac{1}{2}SE\frac{1}{4}$	80.00	Steeply rolling to broken	28	1	VI	1	Private
129	106	3	$SE\frac{1}{4}NW\frac{1}{4}$:$NE\frac{1}{4}SW\frac{1}{4}$:$S\frac{1}{2}SW\frac{1}{4}$	160.00	Gently to steeply rolling	27	1	15/VI:145/VII	1	Private
129	106	4	Lots 5, 6, 7	82.28	Gently to steeply rolling	27	1	VI	1	Private
129	106	11	$N\frac{1}{2}NE\frac{1}{4}$:$SE\frac{1}{4}NE\frac{1}{4}$	120.00	Steeply rolling to rough	26	1	VII	1	Private
129	106	12	$NW\frac{1}{4}NW\frac{1}{4}$	40.00	Gently to steeply rolling	10	1	VI	1	Private
129	106	15	Lot 1, 2. $NE\frac{1}{4}NE\frac{1}{4}$:$E\frac{1}{2}SE\frac{1}{4}$	169.00	Steeply rolling to rough	30	1	34.50/VI:134.50/VII	1	Private
129	106	19	Lot 4	39.41	Steeply rolling to rough	12	1	VI	1	Private
129	106	20	$S\frac{1}{2}NW\frac{1}{4}$	80.00	Steeply rolling to rough	17	1	VII	1	Private
129	106	21	$NW\frac{1}{4}SW\frac{1}{4}$	40.00	Gently to steeply rolling	14	1	V	1	Private
129	106	22	$E\frac{1}{2}NE\frac{1}{4}$	80.00	Steeply rolling to rough	12	1	VII	1	Private
129	106	23	$SE\frac{1}{4}NE\frac{1}{4}$	40.00	Steeply rolling to rough	6	1	VII	1	Private
129	106	24	$SE\frac{1}{4}SW\frac{1}{4}$	40.00	Gently to steeply rolling	10	1	VI	1	Private
129	106	27	Lots 3 and 4	63.90	Gently to steeply rolling	19	1	VI	1	Private
129	106	28	Lot 13	19.50	Sloping, undulating	7	1	V	1	Private
129	106	30	Lot 1	39.47	Gently to steeply rolling	12	1	VI	1	Private
129	106	33	Lots 3, 4: $W\frac{1}{2}W\frac{1}{2}$	227.70	Gently to steeply rolling	52	1	107.70/VI:120/VII	1	Private
129	107	2	Lot 3	40.07	Steeply rolling to rough	8	1	15/VI:25.07/VII	1	Private
129	107	24	$NE\frac{1}{4}SE\frac{1}{4}$:$S\frac{1}{2}SE\frac{1}{4}$	120.00	Gently to steeply rolling	28	1	80/VI:40/VII	1	Private

-Continued

Table 19.- Description, Area, Classification, Suitability and Proposed Management of Unreserved Public Domain, by Counties Within the Little Missouri River Basin, Montana, North Dakota, South Dakota and Wyoming, 1955 - Continued

Fifth P. M. Twp. North	Range West	Sec.	Subdivision	Acres	General Land Character	AUM's	Present Land Use 1/	Land Capability Classification 2/	Principal Suitability 1/	Proposed Management
Bowman County										
129	107	34	Lot 4	51.10	Gently sloping to level	12	1-2	IV	1-2	Private
130	104	2	SE¼NW¼	40.00	Steeply rolling to rough & broken	8	1	VII	1	Private
130	104	6	Lot 1	40.10	Steeply rolling to rough & broken	10	1	VII	1	Private
130	104	9	NW¼SW¼	40.00	Steeply rolling to rough & broken	8	1	VII	1	Private
130	104	18	Lot 4	37.53	Steeply rolling to rough & broken	4	1	20/VII:17.53/VIII	1	Private
130	104	19	S½SE¼	80.00	Steeply rolling to rough & broken	6	1	50/VII:30/VIII	1	Private
130	104	21	S½SE¼	80.00	Steeply rolling to rough & broken	8	1	60/VII:20/VIII	1	Private
130	105	6	Lot 8	48.74	Gently to steeply rolling	17	1	VI	1	Private
130	105	8	S½SW¼	80.00	Gently to steeply rolling	24	1	VI	1	Private
130	105	10	SE¼SW¼:NW¼SW¼:SW¼SE¼	120.00	Gently rolling to badlands	18	1	40/VI:50/VII:30/VIII	1	Private
130	105	11	SE¼NW¼:E½SW¼	120.00	Gently rolling to badlands	20	1	100/VII:20/VIII	1	Private
130	105	13	S½SE¼	80.00	Gently rolling to badlands	8	1	50/VII:30/VIII	1	Private
130	105	18	E½SW¼	80.00	Steeply rolling to rough	25	1	VI	1	Private
130	105	19	Lot 1, 4. NE¼NW¼:SE¼SW¼	157.56	Steeply rolling to rough	36	1	VI	1	Private
130	105	22	SW¼SW¼	40.00	Steeply rolling to rough	6	1	VII	1	Private
130	105	24	N½NE¼:NE¼NW¼	120.00	Steeply rolling to rough	12	1	75/VII:45/VIII	1	Private
130	105	30	NW¼NE¼:S½NE¼	120.00	Steeply rolling to rough	20	1	VII	1	Private
130	105	31	Lot 4:NW¼NE¼:SE¼SW¼: S½SE¼	199.41	Thin breaks, badlands	30	1	VII	1	Private
130	105	32	SW¼NW¼:NE¼SW¼:SW¼SW¼: SE¼SE¼	160.00	Thin breaks to badlands	29	1	VII	1	Private
130	105	33	E½NE¼	80.00	Thin breaks to badlands	16	1	VII	1	Private
130	105	34	NE¼SE¼	40.00	Thin breaks to badlands	2	1	10/VII:30/VIII	1	Private
130	105	35	S½NE¼:SE¼:W½SW¼	320.00	Thin breaks to badlands	16	1	90/VII:230/VIII	1	Private
130	106	1	Lot 4, 11. SE¼SE¼	102.30	Gently to steeply rolling	26	1	15/IV:25/V:40/VI: 22.30/VII	1	Private

- Continued

Table 19.- Description, Area, Classification, Suitability and Proposed Management of Unreserved Public Domain, by Counties Within the Little Missouri River Basin, Montana, North Dakota, South Dakota and Wyoming, 1955 - Continued

Fifth P. M. Twp. North	Range West	Sec.	Subdivision	Acres	General Land Character	AUM's	Present Land Use 1/	Land Capability Classification 2/	Principal Suitability 1/	Proposed Management
Bowman County										
130	106	2	Lots 10, 11	47.62	Gently to steeply rolling	15	1	V	1	Private
130	106	3	Lot 10	24.00	Gently to steeply rolling	5	1	VII	1	Private
130	106	10	Lots 1, 3, 6, 10, 12	108.20	Gently to steeply rolling	27	1	25.20/VI:83/VII	1	Private
130	106	15	Lots 3 and 4	62.76	Steeply rolling to rough	16	1	VI	1	Private
130	106	20	Lot 2	3.00	Undulating sand bars		4	VIII		Private
130	106	21	Lot 11	1.74	Undulating sand bars		4	VIII		Private
130	106	21	NW¼NW¼	40.00	Thin breaks to badlands	7	1	VII	1	Private
130	106	28	Lot 3	4.15	Level to broken, sand bars	1	1	VII	1	Private
130	106	32	Lot 4	15.75	Gently rolling to rough	3	1	VII	1	Private
131	105	4	Lots 1, 2, 3, 4. SE¼NE¼:SE¼: E½SW¼: SW¼SW¼	480.08	Steep coulees. Thin breaks to rough badlands	24	1	VII	1	Private
131	105	10	N½NW¼:SW¼NW¼	120.00	Thin breaks to rough badlands	10	1	VII	1	Private
131	105	15	N½ SW¼	80.00	Thin breaks to rough badlands	6	1	50/VII:30/VIII	1	Private
131	105	17	SE¼NW¼:S½SE¼	120.00	Thin breaks to rough badlands	16	1	VII	1	Private
131	105	18	SW¼NE¼	40.00	Thin breaks to rough badlands	6	1	VII	1	Private
131	105	22	SW¼NW¼	40.00	Thin breaks to rough badlands	4	1	VII	1	Private
131	105	21	W½NW¼:S½SE¼:SE¼SW¼	200.00	Thin breaks to rough badlands	18	1	120/VII:80/VIII	1	Private
131	105	26	SW¼NW¼	40.00	Thin breaks to rough badlands	5	1	VII	1	Private
131	105	27	SE¼SE¼	40.00	Thin breaks to rough badlands	4	1	VII	1	Private
131	105	30	SE¼NW¼. Lots 3 and 5	92.78	Thin breaks to rough badlands	8	1	40.68/VII:52.10/VIII	1	Private
131	105	31	Lots 1, 5, 9	65.14	Thin breaks to rough badlands	10	1	VII	1	Private
131	105	34	NE¼NW¼:NE¼:N½SE¼	280.00	Thin breaks to rough badlands	22	1	200/VII:80/VIII	1	Private
131	106	13	NE¼SE¼: Lots 8 and 9	90.30	Gently to steeply rolling	27	1	40/V:50.30/VI	1	Private
131	106	14	Lot 2	.56	River sand bar			VIII		Private
131	106	23	NE¼NW¼:SW¼SW¼:Lot 2, 4	124.05	Gently to steeply rolling	31	1	10/IV:114.05/VI	1	Private
131	106	24	SW¼NE¼: Lot 5	65.00	Gently to steeply rolling	16	1	40/V:25/VI	1	Private
131	106	25	NW¼SW¼:S½SW¼	120.00	Gently to steeply rolling	31	1	VI	1	Private
131	106	26	SE¼SE¼:W½SE¼:E½SW¼:SW¼SW¼	240.00	Steeply rolling to rough	50	1	VII	1	Private

- Continued

Table 19.- Description, Area, Classification, Suitability and Proposed Management of Unreserved Public Domain, by Counties Within the Little Missouri River Basin, Montana, North Dakota, South Dakota and Wyoming, 1955 - Continued

Fifth P. M. Twp. North	Range West	Sec.	Subdivision	Acres	General Land Character	AUM's	Present Land Use 1/	Land Capability Classification 2/	Principal Suitability 1/	Proposed Management
Bowman County										
131	106	27	SW¼SW¼	40.00	Gently to steeply rolling	9	1	VI	1	Private
131	107	2	Lots 3,4. S½SW¼	159.90	Steeply rolling to rough	27	1	VII	1	Private
132	105	6	Lots 1,2,3,4	85.71	Thin breaks to badlands	12	1	60/VII:25.71/VIII	1	Private
132	105	20	All	640.00	Thin breaks to badlands	45	1	300/VII:340/VIII	1	Private
132	105	26	W½NW¼:S½SW¼	160.00	Thin breaks to badlands	20	1	VII	1	Private
132	105	28	SE¼NW¼	40.00	Thin breaks to badlands	4	1	VII	1	Private
132	105	32	N½:SW¼SW¼:SW¼SE¼:E½SE¼	480.00	Thin breaks to badlands	53	1	240/VII:240/VIII	1	Private
132	105	34	S½NW¼:SW¼:W½SE¼	320.00	Thin breaks to badlands	32	1	220/VII:100/VIII	1	Private
132	106	12	N½N½	160.00	Steeply rolling to rough	24	1	VII	1	Private
132	106	28	NW¼SW¼:NE¼SE¼	80.00	Steeply rolling to rough	12	1	45/VII:35/VIII	1	Private
132	107	26	NE¼NE¼:SW¼:S½SE¼	280.00	Steeply rolling, shale blocks	49	1	VII	1	Private
Dunn County										
146	97	4	SW¼SW¼	40.00	Rough and broken, breaks	9	1	VII	1	Private
146	97	28	NE¼	160.00	Very rough and broken	40	1	VII	1	Private
146	97	30	W½NE¼	80.00	Very rough and broken	27	1	VII	1	Private
147	93	34	Lots 1,2,3,4	116.26	Undulating to rolling	23	1	VII	10	Federal
147	94	20	Lot 4	14.00	Undulating to rolling	2	1	VII	10	Federal
147	94	28	Lot 1	39.20	Undulating to rolling	7	1	VII	10	Federal
147	94	30	Lots 3,4. E½SW¼:SE¼	305.22	Rough, thin breaks	85	1	VII	1	Private
147	95	2	SE¼SW¼	40.00	Rough badlands to thin breaks	6	1	VII	1	Private
147	95	8	S½SE¼:NW¼SE¼	120.00	Rough badlands to thin breaks	16	1	70/VII:50/VIII	1	Private
147	95	10	W½NW¼:NW¼SW¼	120.00	Rough badlands to thin breaks	15	1	80/VII:40/VIII	1	Private
147	96	4	E½E½:SW¼	321.13	Rough steep badlands	45	1	201.13/VII:120/VIII	1	Private
147	96	6	Lots 1,2,3. S½NE¼	201.46	Rough steep badlands	13	1	156.46:VII:45/VIII	1	Private
147	96	10	SE¼	160.00	Rough steep badlands	37	1	120/VII:40/VIII	1	Private

-Continued

Table 19.- Description, Area, Classification, Suitability and Proposed Management of Unreserved Public Domain, by Counties Within the Little Missouri River Basin, Montana, North Dakota, South Dakota and Wyoming, 1955 - Continued

Fifth P. M. Twp. North	Range West	Sec.	Subdivision	Acres	General Land Character	AUM's	Present Land Use 1/	Land Capability Classification 2/	Principal Suitability 1/	Proposed Management
Dunn County										
147	96	12	E½NW¼:N½SE¼	160.00	Rough steep badlands	16	1	105/VII:55/VIII	1	Private
147	97	8	SE¼SW¼	40.00	Generally rough and steep	16	1	30/VII:10/VIII	1	Private
147	97	18	Lots 1, 2, 4. E½E½:NE¼NW¼	316.46	Generally rough and broken	25	1	250/VII:66.46/VIII	1	Private
147	97	30	Lots 1 and 2	77.66	Generally rough and broken	10	1	VII	1	Private
147	97	32	NE¼NW¼:NE¼SE¼	80.00	Very rough and broken	10	1	VII	1	Private
148	95	4	Lot 6	38.22	Very rough and broken	8	1	VII	1	Private
148	95	7	SE¼SE¼	40.00	Very rough and broken	8	1	VII	1	Private
148	95	8	S½SW¼:SW¼SE¼:N½	440.00	Very rough and broken	94	1	VII	1	Private
148	95	9	Lots 1, 2, 3. NW¼NW¼:S½NW¼: N½SW¼	314.18	Very rough and broken	57	1	VII	1	Private
148	95	17	N½NW¼:SE¼NW¼:E½:SW¼SW¼	480.00	Very rough and broken	86	1	VII	1	Private
148	95	18	Lot 2. E½SW¼:NW¼SE¼:NE¼NE¼	203.62	Very rough and broken	33	1	VII	1	Private
148	95	19	SE¼NE¼	40.00	Very rough and broken	7	1	VII	1	Private
148	95	20	N½:N½S½:SE¼SW¼:S½SE¼	600.00	Very rough and broken	108	1	VII	1	Private
148	95	21	All - Lots 1, 2, 3, 4. W½	467.36	Rough broken thin breaks	80	1	VII	1	Private
148	95	28	Lots 1, 2. NW¼:NW¼SW¼	273.20	Rough broken thin breaks	55	1	VII	1	Private
148	95	29	NE¼:N½SE¼:E½NW¼:NE¼SW¼	360.00	Rough broken thin breaks	72	1	VII	1	Private
148	95	30	Lots 1, 2, 3. E½NW¼:W½NE¼: NE¼SW¼:NW¼SE¼	371.73	Rough broken thin breaks	64	1	311.73/VII:60/VIII	1	Private
148	95	31	Lots 2, 4, 5	66.96	Rough broken thin breaks	7	1	46.96/VII:20/VIII	1	Private
148	95	34	SE¼SW¼	40.00	Rough broken thin breaks	7	1	VII	1	Private
148	96	1	SE¼NW¼:SW¼:N½SE¼:SE¼SE¼	320.00	Rough breaks and badlands	38	1	235/VII:85/VIII	1	Private
148	96	2	SE¼NW¼:SW¼NE¼:NW¼SE¼: NE¼SW¼	160.00	Rough breaks and badlands	16	1	125/VII:35/VIII	1	Private
148	96	3	Lots 1 and 2	51.46	Rough breaks and badlands	6	1	36.46/VII:15/VIII	1	Private
148	96	5	Lots 1, 2. S½NE¼:NW¼SE¼	174.64	Rough thin breaks, badlands	23	1	VII	1	Private
148	96	6	Lots 2, 3, 4, 5, 6, 7, 8. SE¼NW¼: SW¼NE¼:NE¼SW¼	297.77	Rough thin breaks, badlands	42	1	VII	1	Private

- Continued

Table 19.- Description, Area, Classification, Suitability and Proposed Management of Unreserved Public Domain, by Counties Within the Little Missouri River Basin, Montana, North Dakota, South Dakota and Wyoming, 1955 - Continued

Fifth P. M. Twp. North	Range West	Sec.	Subdivision	Acres	General Land Character	AUM's	Present Land Use 1/	Land Capability Classification 2/	Principal Suitability 1/	Proposed Management
Dunn County										
148	96	7	Lots 3,4 11:$SE\frac{1}{4}SW\frac{1}{4}$	117.99	Rough thin breaks, badlands	16	1	58.05/VII:59.94/VIII	1	Private
148	96	8	$N\frac{1}{2}SE\frac{1}{4}$:$SE\frac{1}{4}NW\frac{1}{4}$:$NE\frac{1}{4}SW\frac{1}{4}$	160.00	Rough thin breaks, badlands	20	1	120/VII:40/VIII	1	Private
148	96	9	$SW\frac{1}{4}NW\frac{1}{4}$	40.00	Rough thin breaks, badlands	7	1	25/VII:15/VIII	1	Private
148	96	11	$S\frac{1}{2}NE\frac{1}{4}$	80.00	Rough breaks and badlands	10	1	55/VII:25/VIII	1	Private
148	96	17	Lots 1,2,3,4. $N\frac{1}{2}NE\frac{1}{4}$:$SE\frac{1}{4}NE\frac{1}{4}$	270.20	Rough breaks and badlands	36	1	205.20/VII:65/VIII	1	Private
148	96	18	$E\frac{1}{2}NW\frac{1}{4}$	80.00	Rough breaks and badlands	12	1	VII	1	Private
148	96	19	$SE\frac{1}{4}NW\frac{1}{4}$	40.00	Rough breaks and badlands	5	1	VII	1	Private
148	96	21	Lot 5. $S\frac{1}{2}$	354.60	Rough breaks and badlands	42	1	324.60/VII:30/VIII	1	Private
148	96	22	$W\frac{1}{2}SW\frac{1}{4}$:$NE\frac{1}{4}SW\frac{1}{4}$	120.00	Rough breaks and badlands	17	1	90/VII:30/VIII	1	Private
148	96	23	$N\frac{1}{2}SE\frac{1}{4}$:$SW\frac{1}{4}NE\frac{1}{4}$	120.00	Rough breaks and badlands	19	1	75/VII:45/VIII	1	Private
148	96	24	$E\frac{1}{2}NE\frac{1}{4}$	80.00	Rough breaks and badlands	12	1	VII	1	Private
148	96	25	$S\frac{1}{2}NE\frac{1}{4}$	80.00	Rough breaks and badlands	12	1	VII	1	Private
148	96	26	Lots 7 and 9	73.00	Rough breaks and badlands	13	1	VII	1	Private
148	96	28	$N\frac{1}{2}NW\frac{1}{4}$:$NE\frac{1}{4}SE\frac{1}{4}$	120.00	Rough breaks and badlands	18	1	VII	1	Private
148	96	29	$NE\frac{1}{4}NE\frac{1}{4}$:$SE\frac{1}{4}SE\frac{1}{4}$:$W\frac{1}{2}SW\frac{1}{4}$	160.00	Rough breaks and badlands	20	1	100/VII:60/VIII	1	Private
148	96	30	Lots 1,2,3,4. $E\frac{1}{2}W\frac{1}{2}$:$W\frac{1}{2}E\frac{1}{2}$:$E\frac{1}{2}SE\frac{1}{4}$	540.80	Thin breaks and badlands	55	1	340.80/VII:200/VIII	1	Private
148	96	31	$SE\frac{1}{4}NE\frac{1}{4}$:$N\frac{1}{2}SE\frac{1}{4}$:$SE\frac{1}{4}SE\frac{1}{4}$:$NE\frac{1}{4}SW\frac{1}{4}$	200.00	Thin breaks and badlands	20	1	130/VII:70/VIII	1	Private
148	96	34	$NW\frac{1}{4}SW\frac{1}{4}$	40.00	Rough, broken thin breaks	7	1	VII	1	Private
148	97	1	Lots 1,2,3,4,5,6,7,8,11. $S\frac{1}{2}NE\frac{1}{4}$: $SE\frac{1}{4}NW\frac{1}{4}$:$NE\frac{1}{4}SW\frac{1}{4}$	407.75	Thin breaks and badlands	57	1	VII	1	Private
148	97	2	Lots 1,2,3,4,5,6,7,8,9:$W\frac{1}{2}SW\frac{1}{4}$	296.05	Thin breaks and badlands	45	1	VII	1	Private
148	97	3	Lots 1,2,3,4,5,6,7,8:$SE\frac{1}{4}$:$SW\frac{1}{4}$ $NE\frac{1}{4}$:$NE\frac{1}{4}SW\frac{1}{4}$	472.16	Thin breaks and badlands	71	1	VII	1	Private
148	97	4	Lots 1,2,3. $SW\frac{1}{4}NW\frac{1}{4}$:$NW\frac{1}{4}SW\frac{1}{4}$	161.75	Thin breaks and badlands	30	1	137.75/VII:24/VIII	1	Private
148	97	5	Lots 1,2:$S\frac{1}{2}NE\frac{1}{4}$:$SE\frac{1}{4}$: Lot 4	327.35	Thin breaks and badlands	71	1	VII	1	Private
148	97	6	Lots 1,2,3,4,5,6. $SE\frac{1}{4}NW\frac{1}{4}$: $SW\frac{1}{4}SE\frac{1}{4}$	267.43	Thin breaks and badlands	49	1	VII	1	Private
148	97	9	Lots 1 and 2	38.30	Thin breaks and badlands	4	1	30/VII:8.30/VIII	1	Private

-Continued

Table 19.- Description, Area, Classification, Suitability and Proposed Management of Unreserved Public Domain, by Counties Within the Little Missouri River Basin, Montana, North Dakota, South Dakota and Wyoming, 1955 Continued

Fifth P. M. Twp. North	Range West	Sec.	Subdivision	Acres	General Land Character	AUM's	Present Land Use 1/	Land Capability Classification 2/	Principal Suitability 1/	Proposed Management
Dunn County										
148	97	10	$N\frac{1}{2}NE\frac{1}{4}:SE\frac{1}{4}NE\frac{1}{4}:NE\frac{1}{4}SE\frac{1}{4}$	160.00	Thin breaks and badlands	24	1	VII	1	Private
148	97	11	$NW\frac{1}{4}NW\frac{1}{4}:E\frac{1}{2}SE\frac{1}{4}$	120.00	Thin breaks and badlands	19	1	VII	1	Private
148	97	12	$SW\frac{1}{4}:W\frac{1}{2}SE\frac{1}{4}$:Lots 1, 2	269.55	Thin breaks and badlands	39	1	VII	1	Private
148	97	13	$W\frac{1}{2}:W\frac{1}{2}E\frac{1}{2}:SE\frac{1}{4}NE\frac{1}{4}:E\frac{1}{2}SE\frac{1}{4}$	600.00	Thin breaks and badlands	78	1	VII	1	Private
148	97	14	$E\frac{1}{2}$	320.00	Thin breaks and badlands	48	1	VII	1	Private
148	97	15	Lots 4, 5, 10, 11, 12	126.05	Thin breaks and badlands	20	1	VII	1	Private
148	97	19	Lot 4. $SE\frac{1}{4}SW\frac{1}{4}:SW\frac{1}{4}SE\frac{1}{4}$	117.19	Thin breaks and badlands	23	1	VII	1	Private
148	97	22	Lot 2	25.60	Thin breaks and badlands	4	1	VII	1	Private
148	97	23	$E\frac{1}{2}SW\frac{1}{4}:SE\frac{1}{4}$	240.00	Thin breaks and badlands	36	1	VII	1	Private
148	97	24	All	640.00	Thin breaks and badlands	96	1	VII	1	Private
148	97	25	$W\frac{1}{2}$	320.00	Thin breaks and badlands	48	1	VII	1	Private
148	97	26	$E\frac{1}{2}E\frac{1}{2}:NW\frac{1}{4}NE\frac{1}{4}:NE\frac{1}{4}NW\frac{1}{4}:S\frac{1}{2}SW\frac{1}{4}$	320.00	Thin breaks and badlands	48	1	VII	1	Private
148	97	27	$E\frac{1}{2}$	320.00	Thin breaks and badlands	48	1	VII	1	Private
148	97	28	Lot 1, 8. $SW\frac{1}{4}NW\frac{1}{4}$	91.30	Thin breaks and badlands	17	1	VII	1	Private
148	97	29	$S\frac{1}{2}NE\frac{1}{4}:N\frac{1}{2}SE\frac{1}{4}:SW\frac{1}{4}SE\frac{1}{4}:E\frac{1}{2}SW\frac{1}{4}$	280.00	Thin breaks	70	1	VII	1	Private
148	97	30	Lots 2, 3, 4. $SE\frac{1}{4}SW\frac{1}{4}:SW\frac{1}{4}SE\frac{1}{4}$	192.00	Thin breaks and badlands	38	1	VII	1	Private
148	97	31	Lots 1, 2, 3, 4, 5, 6:$E\frac{1}{2}NW\frac{1}{4}:W\frac{1}{2}NE\frac{1}{4}$: $NE\frac{1}{4}NE\frac{1}{4}:NE\frac{1}{4}SW\frac{1}{4}:NW\frac{1}{4}SE\frac{1}{4}$	534.93	Thin breaks and badlands	80	1	444.93/VII:90/VIII	1	Private
148	97	32	$N\frac{1}{2}NW\frac{1}{4}:W\frac{1}{2}NE\frac{1}{4}$	160.00	Thin breaks and badlands	27	1	VII	1	Private
148	97	33	Lots 3 and 6	63.40	Brushy undulating, rough	9	1	VII	1	Private
148	97	21	Lot 2	9.60	Brushy undulating, rough	1	1	VII	1	Private
Golden Valley County										
139	104	6	$SE\frac{1}{4}SE\frac{1}{4}$ (ITA. 037334)	40.00	Top Sentinel Butte	8	1	VII	1	Private
139	104	30	Lot 2	37.15	Rolling to rough	13	1	VII	1	Private

- Continued

Table 19.- Description, Area, Classification, Suitability and Proposed Management of Unreserved Public Domain, by Counties Within the Little Missouri River Basin, Montana, North Dakota, South Dakota and Wyoming, 1955 - Continued

Fifth P. M. Twp. North	Range West	Sec.	Subdivision	Acres	General Land Character	AUM's	Present Land Use 1/	Land Capability Classification 2/	Principal Suitability 1/	Proposed Management
Golden Valley County										
142	103	32	$SE\frac{1}{4}NW\frac{1}{4}$	40.00	Rough and steep	9	1	VII	1	Private
142	105	4	Lots 2, 3. $SE\frac{1}{4}NW\frac{1}{4}$:$SW\frac{1}{4}NE\frac{1}{4}$	160.24	Rough and broken	28	1	VII	1	Private
143	105	18	$SE\frac{1}{4}SE\frac{1}{4}$	40.00	Rolling to rough	12	1	VII	1	Private
143	105	20	$E\frac{1}{2}NE\frac{1}{4}$	80.00	Rolling to rough and broken	20	1	VII	1	Private
144	103	4	Lots 1, 2, 3, 4, 5, 6, 7, 8. $SE\frac{1}{4}$:$S\frac{1}{2}SW\frac{1}{4}$	528.80	Rough badlands to breaks	121	1	VII	1	Private
144	103	6	Lots 1, 2, 7, 8, 9, 10, 11. $SE\frac{1}{4}$	428.56	Rough badlands to breaks	75	1	VII	1	Private
144	103	8	$NW\frac{1}{4}NE\frac{1}{4}$:$NW\frac{1}{4}$:$N\frac{1}{2}SW\frac{1}{4}$:$SW\frac{1}{4}SW\frac{1}{4}$	320.00	Rough badlands to breaks	66	1	VII	1	Private
144	103	18	Lots 1, 2. $NE\frac{1}{4}$:$NE\frac{1}{4}SE\frac{1}{4}$:$S\frac{1}{2}SE\frac{1}{4}$	332.92	Rough badlands to breaks	66	1	VII	1	Private
144	103	20	$E\frac{1}{2}E\frac{1}{2}$	160.00	Rough broken badlands	32	1-4	VII	1-4	Private
144	103	30	$SE\frac{1}{4}$	160.00	Rough broken badlands	32	1-4	VII	1-4	Private
144	103	32	$NW\frac{1}{4}NW\frac{1}{4}$:$E\frac{1}{2}SW\frac{1}{4}$	120.00	Rough broken badlands	32	1-4	VII	1-4	Private
144	104	2	Lots 2, 3, 4, 5, 6, 12	230.58	Mostly rough badlands	47	1	VI	1	Private
McKenzie County										
146	98	12	$E\frac{1}{2}E\frac{1}{2}$:$SW\frac{1}{4}SE\frac{1}{4}$	200.00	Thin breaks to badlands	56	1	VII	1	Private
150	97	30	$SW\frac{1}{4}NE\frac{1}{4}$:$NW\frac{1}{4}SE\frac{1}{4}$	80.00	Rolling to hilly, rough	32	1	VII	1	Private
152	93	8	Lot 4	14.95	Steeply rolling	15	1	VI	1	U. S. Army
152	97	4	$NW\frac{1}{4}SW\frac{1}{4}$	40.00	Steeply rolling to rough	16	1	VII	1	U. S. D. A.
152	97	30	$NW\frac{1}{4}NE\frac{1}{4}$	40.00	Level to rough	11	1	8/IV:32/VII	1	Private
South Dakota Fifth P. M. Twp. North	Range East									
Harding County										
15	1	6	Lots 1, 2, 3 4	66.55	Gently sloping to rolling	19		VI	1	Private

- Continued

Table 19.- Description, Area, Classification, Suitability and Proposed Management of Unreserved Public Domain, by Counties Within the Little Missouri River Basin, Montana, North Dakota, South Dakota and Wyoming, 1955 - Continued

Fifth P. M. Twp. North	Range East	Sec.	Subdivision	Acres	General Land Character	AUM's	Present Land Use 1/	Land Capability Classification 2/	Principal Suitability 1/	Proposed Management
Harding County										
15	1	7	Lots 1, 2, 3, 4	64.98	Gently sloping to gently rolling	18	1	VI	1	Private
15	1	9	SE¼NW¼:NE¼NE¼	80.00	Gently sloping to gently rolling	16	1	VI	1	Private
16	1	31	Lots 1, 2, 3, 4	66.30	Gently to steeply rolling	18	1	VI	1	Private
17	1	26	SE¼	160.00	Steeply rolling, rough	36	1	80/VI:55/VII:25/VIII	1	Private
17	1	29	SW¼SE¼	40.00	Steeply rolling, rough	11	1	VI	1	Private
17	2	25	S½NW¼:SW¼NE¼	120.00	Gently rolling, undulating	38	1	V	1	Private
17	2	29	SE¼NW¼	40.00	Steeply rolling sand hills	11	1	VI	1	Private
17	3	30	Lot 1	39.59	Level to undulating	13	8	IV	8	Federal
18	1	1	Lot 4	1.88	Level to undulating		1	V	1	Private
18	1	27	SE¼SW¼	40.00	Gently rolling to sloping	11	1	VI	1	Private
18	1	28	Lot 9. SE¼SE¼	62.60	Gently to steeply rolling	18	1	VI	1	Private
18	1	29	SW¼SW¼	40.00	Gently to steeply rolling	13	1	VI	1	Private
19	1	12	NE¼SW¼	40.00	Nearly level, hummocky	7	1	VII	1	Private
19	2	18	Lot 1	00.20	Nearly level, sand bar		9	VIII	9	Private
19	2	19	Lot 6	20.10	Gently rolling	7	1	VI	1	Private
19	2	20	SW¼NW¼:N½SW¼:SE¼NE¼: NW¼SE¼	200.00	Gently rolling	63	1	40/V:160/VI	1	Private
20	1	6	Lots 1, 2, 3, 4	106.47	Gently to steeply rolling	30	1	VI	1	Private
20	1	7	Lot 1	26.15	Gently to steeply rolling	8	1	VI	1	Private
20	1	20	SW¼NW¼	40.00	Gently to steeply rolling	9	1	VI	1	Private
20	1	21	E½NE¼	80.00	Gently to steeply rolling	19	1	VI	1	Private
20	1	29	NE¼SE¼	40.00	Gently to steeply rolling	10	1	VI	1	Private
20	2	4	Lots 6 and 10	47.70	Steeply sloping, rolling	16	1	27.20/IV:20.50/VII	1	Private
20	2	5	Lots 8 and 9	66.40	Gently to steeply sloping	22	1	38.90/IV:27.50/VI	1	Private
20	2	19	Lot 6	39.71	Gently to steeply sloping	13	1	V	1	Private
20	2	30	Lot 3	7.10	Gently to steeply sloping	2	1	V	1	Private
20	2	31	Lot 3	15.96	Gently to steeply sloping	5	1	V	1	Private
20	3	22	NE¼NW¼	40.00	Gently to steeply rolling	12	1	VI	1	Private

- Continued

Table 19.- Description, Area, Classification, Suitability and Proposed Management of Unreserved Public Domain, by Counties Within the Little Missouri River Basin, Montana, North Dakota, South Dakota and Wyoming, 1955 - Continued

Fifth P. M. Twp. North	Range East	Sec.	Subdivision	Acres	General Land Character	AUM's	Present Land Use 1/	Land Capability Classification 2/	Principal Suitability 1/	Proposed Management
Harding County										
21	1	1	Lots 1 and 2	79.84	Shale and Scoria Hills	17	1	VII	1	Private
21	1	7	Lots 1, 2, 3, 4	166.48	Gently to steeply rolling	42	1	VI	1	Private
21	1	8	$W\frac{1}{2}NW\frac{1}{4}$	80.00	Gently to steeply rolling	24	1	VI	1	Private
21	1	17	$W\frac{1}{2}NE\frac{1}{4}$:$SE\frac{1}{4}NW\frac{1}{4}$	120.00	Gently to steeply rolling	34	1	VI	1	Private
21	1	23	$SE\frac{1}{4}SE\frac{1}{4}$	40.00	Steep scoria hills, shaley	7	1	VII	1	Private
21	1	24	$NW\frac{1}{4}SW\frac{1}{4}$	40.00	Steep scoria hills, shaley	7	1	VII	1	Private
21	1	30	Lots 1 and 2	76.76	Gently to steeply rolling	20	1	VI	1	Private
21	2	4	Lot 7	13.80	Gently sloping to rolling	4	1	V	1	Private
21	2	5	Lots 6 and 7	24.50	Gently sloping to rolling	7	1	VI	1	Private
21	2	8	Lots 3 and 4	59.00	Gently sloping to rolling	16	1	VI	1	Private
21	2	15	Lot 3	17.80	Gently sloping to rolling	6	1	V	1	Private
21	2	23	$SW\frac{1}{4}SE\frac{1}{4}$	40.00	Steeply rolling, hummocky	9	1	VII	1	Private
21	2	25	$SE\frac{1}{4}NE\frac{1}{4}$:$NE\frac{1}{4}SE\frac{1}{4}$	80.00	Gently to steeply rolling	22	1	VI	1	Private
21	2	26	$NE\frac{1}{4}NW\frac{1}{4}$:$N\frac{1}{2}NE\frac{1}{4}$:$SE\frac{1}{4}NE\frac{1}{4}$: $SW\frac{1}{4}SE\frac{1}{4}$	200.00	Gently to steeply rolling	52	1	160/VI:40/VII	1	Private
21	2	28	Lots 4, 8 and 9	40.95	Gently to steeply rolling	12	1	VI	1	Private
21	2	31	$SE\frac{1}{4}$	160.00	Gently to steeply rolling	40	1	VI	1	Private
21	3	4	Lot 2	40.20	Gently to steeply rolling	10	1	VI	1	Private
21	3	10	$NE\frac{1}{4}SE\frac{1}{4}$	40.00	Gently to steeply rolling	10	1	VI	1	Private
21	3	32	$NW\frac{1}{4}NE\frac{1}{4}$	40.00	Steeply rolling to rough	10	1	VII	1	Private
22	1	9	$SE\frac{1}{4}NW\frac{1}{4}$:$NE\frac{1}{4}SW\frac{1}{4}$	80.00	Gently to steeply rolling	18	1	VI	1	Private
22	1	10	$S\frac{1}{2}NE\frac{1}{4}$:$N\frac{1}{2}SE\frac{1}{4}$:$SW\frac{1}{4}$	320.00	Gently to steeply rolling	72	1	VI	1	Private
22	1	24	$NW\frac{1}{4}NE\frac{1}{4}$	40.00	Gently to steeply rolling	7	1	30/VI:10/VII	1	Private
22	1	31	Lots 1, 2, 3, 4	177.20	Gently to steeply rolling	50	1	VI	1	Private
22	1	32	$W\frac{1}{2}$	320.00	Gently to steeply rolling	82	1	VI	1	Private
22	1	33	$NW\frac{1}{4}NW\frac{1}{4}$	40.00	Gently to steeply rolling	12	1	VI	1	Private
22	2	1	Lots 1, 2. $S\frac{1}{2}NE\frac{1}{4}$:$S\frac{1}{2}$	480.03	Thin breaks to badlands	40	1	260/VI:120/VII: 100.03/VIII	1	Private
22	2	2	Lots 1, 4:$S\frac{1}{2}NE\frac{1}{4}$:$SE\frac{1}{4}NW\frac{1}{4}$:$E\frac{1}{2}$ $SW\frac{1}{4}$:$SE\frac{1}{4}$	440.38	Thin breaks to badlands	59	1	190/VI:180.29/VII: 70.09/VIII	1	Private

- Continued

Table 19.- Description, Area, Classification, Suitability and Proposed Management of Unreserved Public Domain, by Counties Within the Little Missouri River Basin, Montana, North Dakota, South Dakota and Wyoming, 1955 - Continued

Fifth P. M. Twp. North	Range East	Sec.	Subdivision	Acres	General Land Character	AUM's	Present Land Use 1/	Land Capability Classification 2/	Principal Suitability 1/	Proposed Management
Harding County										
22	2	4	Lot 7:SE¼SE¼	44.10	Gently to steeply rolling	13	1	VI	1	Private
22	2	6	Lots 3 and 4	75.81	Gently to steeply rolling	16	1	VI	1	Private
22	2	9	N½SE¼	80.00	Gently to steeply rolling	22	1	VI	1	Private
22	2	11	NW¼NW¼	40.00	Thin breaks, rough broken	6	1	VII	1	Private
22	2	17	Lots 2 and 5	43.60	Steeply rolling rough, broken	11	1	VI	1	Private
22	2	21	Lots 8 and 14	40.20	Steeply rolling rough, broken	8	1	VII	1	Private
22	2	23	N½SE¼:SW¼SE¼	120.00	Steeply rolling rough, broken	20	1	40/VI:60/VII:20/VIII	1	Private
22	3	6	Lots 3, 4:E½SW¼:SE¼	310.20	Thin breaks to badlands	31	1	140/VI:100/VII:70.20/VIII	1	Private
22	3	7	Lots 1, 2, 3:E½NW¼:N½NE¼:NE¼SW¼	306.08	Thin breaks to badlands	34	1	180/VI:126.08/VII	1	Private
22	3	8	NW¼:W½NE¼:SE¼:E½SW¼	480.00	Thin breaks to badlands	43	1	260/VI:110/VII:110/VIII	1	Private
22	3	18	NE¼SE¼	40.00	Thin breaks to badlands	4	1	30/VII:10/VIII	1	Private
22	3	30	NE¼NW¼	40.00	Gently to steeply rolling	10	1	VI	1	Private
23	1	25	NE¼	160.00	Gently rolling, shale spots	40	1	VI	1	Private
23	2	19	Lot 4	18.95	Gently to steeply rolling	4	1	VI	1	Private
23	2	20	Lots 7 and 8	56.05	Gently to steeply rolling	12	1	VI	1	Private
23	2	28	S½NW¼	80.00	Gently to steeply rolling	20	1	60/VI:20/VII	1	Private
23	2	29	Lots 4 and 10	64.00	Gently to steeply rolling	18	1	VI	1	Private
23	2	32	Lot 1	9.10	Gently to steeply rolling	2	1	VI	1	Private
23	3	20	Lot 1	24.38	Very steeply rolling, rough	7	1	VI	1	Private
23	3	21	Lot 4	24.31	Very steeply rolling, rough	7	1	VI	1	Private

- Continued

Table 19.- Description, Area, Classification, Suitability and Proposed Management of Unreserved Public Domain, by Counties Within the Little Missouri River Basin, Montana, North Dakota, South Dakota and Wyoming, 1955 - Continued

Wyoming
Sixth P. M.

Twp. North	Range West	Sec.	Subdivision	Acres	General Land Character	AUM's	Present Land Use 1/	Land Capability Classification 2/	Principal Suitability 1/	Proposed Management
Crook County										
53	67	4	SW¼SE¼	40.00	Rolling to rough	4	1	VI	1	Private
53	67	4	Lot 4:NE¼SW¼	79.72	Rolling to rough	8	1	VII	1	Private
53	67	5	Lot 1	39.63	Rolling to rough	4	1	VII	1	Private
53	67	18	NW¼SE¼	40.00	Rolling to rough	12	1	VI	1	Private
53	67	21	SW¼NW¼	40.00	Rolling to rough	6	1	VII	1	Private
53	67	3	NE¼SW¼:SE¼	200.00	Rolling to rough	60	1	VI	1	Private
53	67	10	W½NE¼	80.00	Rolling to rough	24	1	VI	1	Private
53	67	10	NE¼NE¼	40.00	Rolling to rough	11	1	30/VI:10/VII	1	Private
53	67	10	SE¼NE¼	40.00	Rough to mountainous	8	1	15/VI:25/VII	1	Private
53	67	11	SW¼NW¼	40.00	Rough to mountainous	4	1	VII	1	Private
53	67	11	SE¼NW¼	40.00	Rough to mountainous	3	1	VII	1	Private
53	67	11	NE¼SW¼	40.00	Rough to mountainous	6	1	20/VI:20/VII	1	Private
53	67	11	SE¼SW¼	40.00	Rough to mountainous	5	1	5/VI:35/VII	1	Private
53	67	11	NE¼SE¼	40.00	Rolling to rough & mountainous	6	1	25/VI:15/VII	1	Private
53	67	11	NW¼SE¼	40.00	Rolling to rough & mountainous	2	1	VI	1	Private
53	67	11	SE¼SE¼	40.00	Rolling to rough & mountainous	8	1	VI	1	Private
53	67	11	SW¼SE¼	40.00	Rolling to rough & mountainous	8	1	35/VI:5/VII	1	Private
53	67	14	NE¼	160.00	Rolling	32	1	VI	1	Private
53	67	14	E½SE¼:NW¼SE¼	120.00	Rolling	24	1	VI	1	Private
53	67	14	NE¼SW¼	40.00	Rough and mountainous	6	1	10/VI:30/VII	1	Private
53	67	23	S½S½	160.00	Rough and mountainous	24	1	VII	1	Private
53	68	21	SW¼SW¼	40.00	Rolling to rough	8	1	VI	1	Private
53	68	33	NE¼NE¼	40.00	Rolling to rough	6	1	VII	1	Private
54	66	18	Lot 3	37.48	Mountainous	2	1	VII	1	Private
54	66	19	Lot 1	37.87	Mountainous	2	1	VII	1	Private
54	66	19	Lot 2	37.94	Mountainous	2	1	VII	1	Private
54	66	19	Lot 3	38.08	Mountainous	2	1	VII	1	Private

- Continued

Table 19. - Description, Area, Classification, Suitability and Proposed Management of Unreserved Public Domain, by Counties Within the Little Missouri River Basin, Montana, North Dakota, South Dakota and Wyoming, 1955 - Continued

Sixth P. M. Twp. North	Range West	Sec.	Subdivision	Acres	General Land Character	AUM's	Present Land Use 1/	Land Capability Classification 2/	Principal Suitability 1/	Proposed Management
Crook County										
54	66	19	Lot 4	38.21	Mountainous	2	1	VII	1	Private
54	66	19	NE¼NW¼	40.00	Mountainous	2	1	VII	1	Private
54	66	19	SE¼NW¼	40.00	Mountainous	2	1	VII	1	Private
54	66	19	SE¼SW¼	40.00	Mountainous	2	1	VII	1	Private
54	66	30	Lot 1	38.45	Mountainous	2	1	VII	1	Private
54	66	30	Lot 2	38.79	Mountainous	4	1	VII	1	Private
54	66	30	NE¼NW¼	40.00	Mountainous	3	1	VII	1	Private
54	67	28	SW¼NE¼	40.00	Rolling to rough	6	1-4-6	VII	1-4-6	Private
54	67	25	SE¼NE¼	40.00	Rough to mountainous	3	1-4-6	VII	1-4-6	Private
54	67	34	NE¼NE¼	40.00	Rolling to rough	2	1-4-6	VII	1-4-6	Private
54	67	35	SE¼NE¼	40.00	Rough to mountainous	4	1-4-6	VII	1-4-6	Private
54	67	1	Lot 4:SE¼NW¼:NW¼SE¼	120.53	Rough to mountainous	12	1-4-6	VII	1-4-6	Private
54	67	1	SW¼NE¼	40.00	Rough to mountainous	3	1-4-6	VII	1-4-6	Private
54	67	1	NE¼SE¼	40.00	Rough to mountainous	2	1-4-6	VII	1-4-6	Private
54	67	21	NE¼NW¼	40.00	Rolling to rough	6	1-4-6	VII	1-4-6	Private
54	67	24	SE¼NE¼	40.00	Rough and mountainous	2	1-4-6	VII	1-4-6	Private
54	67	24	NE¼SE¼	40.00	Rough and mountainous	2	1-4-6	VII	1-4-6	Private
54	67	24	SE¼SE¼	40.00	Rough and mountainous	2	1-4-6	VII	1-4-6	Private
54	67	25	NW¼NE¼	40.00	Rough and mountainous	2	1-4-6	VII	1-4-6	Private
54	67	25	NE¼NE¼	40.00	Rough and mountainous	2	1-4-6	VII	1-4-6	Private
54	68	19	NE¼NW¼	40.00	Rolling to rough	8	1-4-6	VII	1-4-6	Private
54	68	24	SE¼SE¼	40.00	Rolling to rough	6	1-4-6	VII	1-4-6	Private
54	68	25	N½N½:SW¼NW¼:SE¼SW¼	240.00	Rolling to rough	36	1-4-6	VII	1-4-6	Private
54	68	26	SE¼NE¼	40.00	Rolling to rough	6	1-4-6	VII	1-4-6	Private
54	68	26	SE¼SW¼	40.00	Rolling	8	1-4-6	VI	1-4-6	Private
54	68	29	SE¼NE¼	40.00	Rolling	8	1-4-6	VI	1-4-6	Private

- Continued

Table 19.- Description, Area, Classification, Suitability and Proposed Management of Unreserved Public Domain, by Counties Within the Little Missouri River Basin, Montana, North Dakota, South Dakota and Wyoming, 1955 - Continued

Sixth P. M. Twp. North	Range West	Sec.	Subdivision	Acres	General Land Character	AUM's	Present Land Use 1/	Land Capability Classification 2/	Principal Suitability 1/	Proposed Management
Crook County										
54	68	32	NW¼SE¼	40.00	Rolling to rough	8	1-4-6	VI	1-4-6	Private
54	68	34	SW¼SE¼	40.00	Rolling	8	1-4-6	VI	1-4-6	Private
54	68	35	SW¼NE¼	40.00	Rolling	8	1-4-6	VI	1-4-6	Private
55	65	19	Lot 5	37.51	Rolling to rough	2	1	10/VI:27.51/VII	1	Private
55	66	2	Lots 5 and 6	40.96	Rolling to rough	6	1	VII	1	Private
55	66	3	Lot 5	8.92	Rolling to rough	2	1	VII	1	Private
55	66	3	Lot 10	9.91	Rolling to rough	7	1-2	VI	1-2	Private
55	66	10	Lot 4	14.26	Rolling to rough	3	1	VI	1	Private
55	66	11	Lots 1 and 4	46.17	Rolling to rough	7	1	VII	1	Private
55	66	11	Lots 2 and 3	61.58	Rolling to rough	22	1-2	VII	1-2	Private
55	66	14	Lots 2 and 3	52.44	Rolling to rough	8	1	VII	1	Private
55	66	15	Lots 5 and 6	60.04	Rolling to rough	9	1	VII	1	Private
55	66	4	Lot 7	24.61	Rough to mountainous	4	1	VII	1	Private
55	66	5	SW¼NE¼	40.00	Rough to mountainous	6	1	VII	1	Private
55	66	6	SW¼NE¼:W½SE¼	120.00	Rough to mountainous	12	1	VII	1	Private
55	66	7	NW¼SE¼:E½NE¼	120.00	Rough to mountainous	18	1	VII	1	Private
55	66	8	Lots 2 and 3:SW¼NW¼	109.61	Rough to mountainous	16	1	VII	1	Private
55	66	9	Lot 4	12.40	Rough to mountainous	17	1-2	VII	1-2	Private
55	66	9	Lots 5 and 6	79.84	Rough to mountainous	8	1	VII	1	Private
55	66	9	Lot 7	27.56	Rough to mountainous	4	1	VII	1	Private
55	66	9	Lots 9 and 10	49.34	Rough to mountainous	10	1	VII	1	Private
55	66	9	Lot 11	36.95	Rough to mountainous	6	1-4-6	VII	1	Private
55	66	9	Lot 12	38.65	Rough to mountainous	7	1-4-6	VII	1	Private
55	66	16	Lot 3	20.20	Rough to mountainous	8	1-2	VIII	1=2	Private
55	66	16	Lot 4	16.55	Rough to mountainous	0	1	VIII	1	Private
55	66	19	Lots 7 and 9	57.38	Rough to mountainous	9	1	VII	1	Private
55	66	19	Lots 12 and 13	29.53	Rough to mountainous	0	7	VII	7	Private
55	66	30	Lots 5 & 7:NE¼NE¼	99.44	Rough to mountainous	0	7	VII	7	Private

- Continued

Table 19.- Description, Area, Classification, Suitability and Proposed Management of Unreserved Public Domain, by Counties Within the Little Missouri River Basin, Montana, North Dakota, South Dakota and Wyoming, 1955 - Continued

Sixth P. M. Twp. North	Range West	Sec.	Subdivision	Acres	General Land Character	AUM's	Present Land Use 1/	Land Capability Classification 2/	Principal Suitability 1/	Proposed Management
Crook County										
55	67	2	$NW\frac{1}{4}SW\frac{1}{4}$	40.00	Rough to mountainous	4	1-4-6	VII	1-4-6	Private
55	67	2	$SW\frac{1}{4}SW\frac{1}{4}$	40.00	Rough to mountainous	4	1-4-6	VII	1-4-6	Private
55	67	3	$SE\frac{1}{4}NE\frac{1}{4}$	40.00	Rough to mountainous	4	1-4-6	VII	1-4-6	Private
55	67	11	$NW\frac{1}{4}NW\frac{1}{4}$	40.00	Rough to mountainous	4	1-4-6	VII	1-4-6	Private
55	67	11	$SW\frac{1}{4}NW\frac{1}{4}$	40.00	Rough to mountainous	4	1-4-6	VII	1-4-6	Private
55	67	23	$SW\frac{1}{4}NW\frac{1}{4}$	40.00	Rough to mountainous	24	1-4-6	VII	1-4-6	Private
55	67	23	$SE\frac{1}{4}SW\frac{1}{4}$	40.00	Rough to mountainous	6	1-4-6	VII	1-4-6	Private
55	67	24	$SE\frac{1}{4}SE\frac{1}{4}$	40.00	Rough to mountainous	0	6-7	VII	6-7	Private
55	67	25	$NW\frac{1}{4}SW\frac{1}{4}$	40.00	Rough to mountainous	4	1	VII	1	Private
55	67	4	$SE\frac{1}{4}NE\frac{1}{4}$	40.00	Rolling	8	1	VII	1	Private
55	67	4	$SW\frac{1}{4}NE\frac{1}{4}$	40.00	Rolling	10	1-4-6	15/VI:25/VII	1-4-6	Private
55	67	4	$SE\frac{1}{4}SE\frac{1}{4}$	40.00	Rolling to rough	2	1-4-6	20/VII:20/VIII	1-4-6	Private
55	67	4	$SW\frac{1}{4}SE\frac{1}{4}$	40.00	Rolling to rough	1	1-4-6	15/VII:25/VIII	1-4-6	Private
55	67	6	Lot 5:$SE\frac{1}{4}NW\frac{1}{4}$	76.16	Rolling to rough	4	1-4-6	VII	1-4-6	Private
55	67	6	$SE\frac{1}{4}NE\frac{1}{4}$	40.00	Rolling to rough	4	1-4-6	VII	1-4-6	Private
55	67	6	$NE\frac{1}{4}SE\frac{1}{4}$:$SW\frac{1}{4}SE\frac{1}{4}$	80.00	Rolling to rough	8	1-4-6	VII	1-4-6	Private
55	68	20	$NW\frac{1}{4}NW\frac{1}{4}$	40.00	Rolling	12	1-4-6	VI	1-4-6	Private
55	68	23	Lot 3	21.20	Rolling	4	1-4-6	VI	1-4-6	Private
55	68	30	Lot 1	36.96	Rolling to rough	7	1-4-6	VII	1-4-6	Private
55	68	33	Lot 1	5.67	Rolling to rough	1/2	1-4-6	VII	1-4-6	Private
55	68	36	Lot 1	4.96	Rolling	1	1-4-6	VI	1-4-6	Private
55	68	36	Lot 2	5.66	Rolling to rough	1/2	1-4-6	VII	1-4-6	Private
55	68	1	Lots 5, 6, 7 and 11	162.41	Rolling to rough	16	1	VII	1	Private
55	68	1	Lot 12	34.48	Rolling to rough	4	1	14.48/VI:20/VII	1	Private
55	68	1	$SE\frac{1}{4}SW\frac{1}{4}$	40.00	Rolling	8	1	VI	1	Private
55	68	1	$N\frac{1}{2}SW\frac{1}{4}$	80.00	Rolling to rough	10	1	15/VI:65/VII	1	Private
55	68	2	Lot 5:$SE\frac{1}{4}NE\frac{1}{4}$:$NE\frac{1}{4}SE\frac{1}{4}$	120.59	Rolling to rough	12	1	VII	1	Private

- Continued

Table 19.- Description, Area, Classification, Suitability and Proposed Management of Unreserved Public Domain, by Counties Within the Little Missouri River Basin, Montana, North Dakota, South Dakota and Wyoming, 1955 - Continued

Sixth P. M. Twp. North	Range West	Sec.	Subdivision	Acres	General Land Character	AUM's	Present Land Use 1/	Land Capability Classification 2/	Principal Suitability 1/	Proposed Management
Crook County										
55	68	2	NW¼SE¼	40.00	Rolling to rough	5	1	10/VI:30/VII	1	Private
55	68	4	Lot 5	38.58	Rolling to rough	6	1	VII	1	Private
55	68	6	Lot 10:SW¼NE¼:NW¼SE¼	117.12	Rolling	35	1	VI	1	Private
55	68	11	Lot 4	6.81	Rolling	2	1	VI	1	Private
55	68	12	Lot 3	23.04	Rolling	5	1	VI	1	Private
55	68	18	NW¼SE¼	40.00	Rolling	8	1	VI	1	Private
55	68	18	NE¼SW¼	40.00	Rolling to rough	4	1	VII	1	Private
56	64	18	NE¼NE¼	40.00	Rough to rolling	6	1	VII	1	Private
56	65	14	Lot 3	39.69	Rough to mountainous	4	1	VII	1	Private
56	65	15	Lot 9	39.43	Rough to mountainous	5	1	VII	1	Private
56	65	19	Lot 6	39.51	Rough to mountainous	6	1	VII	1	Private
56	65	20	Lot 4	39.50	Rough to mountainous	6	1	VII	1	Private
56	65	20	Lot 6	39.48	Rough to mountainous	6	1	VII	1	Private
56	65	20	Lot 7	39.53	Rough to mountainous	6	1	VII	1	Private
56	65	29	Lot 7	39.38	Rough to mountainous	4	1	VII	1	Private
56	65	33	Lot 14	40.87	Rough to mountainous	4	1	VII	1	Private
56	66	34	Lot 1	30.01	Rolling	6	1-4-6	VI	1-4-6	Private
56	67	34	SW¼SE¼	40.00	Rolling to rough	7	1-4-6	VII	1-4-6	Private
57	63	2	Lot 4	40.14	Flat	8	1	V	1	Private
57	63	6	Lot 5	38.48	Rolling to rough	4	1	VII	1	Private
57	63	7	Lot 2	38.42	Rolling to rough	5	1	VII	1	Private
57	63	7	Lots 3 and 4	76.65	Rolling to rough	12	1	VII	1	Private
57	63	19	Lot 3	39.16	Rolling to rough	8	1	VII	1	Private
57	64	6	Lot 7:SW¼NE¼	78.73	Rolling	16	1	VI	1	Private
57	64	8	N½NE¼:SW¼NE¼:SE¼NW¼	160.00	Rolling to rough	8	1	VII	1	Private
57	64	8	SW¼NW¼:NW¼SW¼:SW¼SW¼	120.00	Rolling to rough	6	1	VII	1	Private

- Continued

Table 19.- Description, Area, Classification, Suitability and Proposed Management of Unreserved Public Domain, by Counties Within the Little Missouri River Basin, Montana, North Dakota, South Dakota and Wyoming, 1955 - Continued

Sixth P. M. Twp. North	Range West	Sec.	Subdivision	Acres	General Land Character	AUM's	Present Land Use 1/	Land Capability Classification 2/	Principal Suitability 1/	Proposed Management
Crook County										
57	64	19	Lot 3	39.34	Rolling	8	1	VI	1	Private
57	64	20	$S\frac{1}{2}SE\frac{1}{4}$	80.00	Precipitous	0	6	VIII	6	Private
57	64	28	$SE\frac{1}{4}SE\frac{1}{4}$:$SW\frac{1}{4}SW\frac{1}{4}$	80.00	Precipitous	1	1	10/VI:70/VIII	1	Private
57	64	30	$NE\frac{1}{4}NE\frac{1}{4}$	40.00	Rolling to steep	6	1	VII	1	Private
57	64	2	$SE\frac{1}{4}NE\frac{1}{4}$:$SW\frac{1}{4}SE\frac{1}{4}$:$SE\frac{1}{4}SW\frac{1}{4}$: $W\frac{1}{2}SW\frac{1}{4}$	200.00	Rolling to rough	20	1	40/VI:160/VII	1	Private
57	64	3	$S\frac{1}{2}NE\frac{1}{4}$	80.00	Level	32	1	VI	1	Private
57	64	3	$SW\frac{1}{4}SW\frac{1}{4}$	40.00	Rolling	12	1	VI	1	Private
57	64	10	$NW\frac{1}{4}NW\frac{1}{4}$	40.00	Rolling to rough	8	1	20/VI:20/VII	1	Private
57	64	10	$S\frac{1}{2}NW\frac{1}{4}$	80.00	Rolling to rough	8	1	VII	1	Private
57	64	11	$E\frac{1}{2}$:$E\frac{1}{2}W\frac{1}{2}$	480.00	Rolling to rough	48	1	VII	1	Private
57	64	14	$N\frac{1}{2}$	320.00	Rolling to rough	32	1	VII	1	Private
57	64	15	$N\frac{1}{2}$:$N\frac{1}{2}SW\frac{1}{4}$	400.00	Rolling to rough	40	1	VII	1	Private
57	64	15	$NW\frac{1}{4}SE\frac{1}{4}$	40.00	Rolling to rough	5	1	VII	1	Private
57	64	15	$SW\frac{1}{4}SE\frac{1}{4}$	40.00	Rolling to rough	7	1	VII	1	Private
57	64	22	$NW\frac{1}{4}NE\frac{1}{4}$	40.00	Rolling to rough	6	1	VII	1	Private
57	64	22	$SW\frac{1}{4}NE\frac{1}{4}$:$SW\frac{1}{4}SE\frac{1}{4}$	80.00	Rolling to rough	16	1	VII	1	Private
57	64	24	$SW\frac{1}{4}NE\frac{1}{4}$	40.00	Rolling to rough	6	1	VII	1	Private
57	65	24	$SE\frac{1}{4}NW\frac{1}{4}$	40.00	Rolling	8	1	VI	1	Private
57	68	2	$S\frac{1}{2}NE\frac{1}{4}$	80.00	Rolling	16	1	VI	1	Private
57	68	3	Lot 5	19.54	Rolling	3	1	VI	1	Private
57	68	21	Lot 1	33.35	Rolling	7	1	VI	1	Private
57	68	22	Lot 3	30.39	Rolling	6	1	VI	1	Private
57	68	22	Lot 4	25.27	Rolling	5	1	VI	1	Private
57	68	23	$SW\frac{1}{4}NE\frac{1}{4}$	40.00	Rolling	8	1	VI	1	Private
57	68	26	Lots 1 & 2:$S\frac{1}{2}SE\frac{1}{4}$	129.10	Rolling	26	1	VI	1	Private
57	68	27	Lot 1:$NW\frac{1}{4}SE\frac{1}{4}$:$SW\frac{1}{4}NE\frac{1}{4}$	96.28	Rolling	19	1	VI	1	Private
57	68	30	Lot 6	50.49	Rolling	3	1	VI	1	Private

- Continued

Table 19.- Description, Area, Classification, Suitability and Proposed Management of Unreserved Public Domain, by Counties Within the Little Missouri River Basin, Montana, N rth Dakota, South Dakota and Wyoming, 1955 - Continued

Sixth P. M. Twp. North	Range West	Sec.	Subdivision	Acres	General Land Character	AUM's	Present Land Use 1/	Land Capability Classification 2/	Principal Suitability 1/	Proposed Management
Crook County										
57	68	34	Lots 4 & 5: Lot 3:$SE\frac{1}{4}SE\frac{1}{4}$	90.99	Rolling	18	1	VI	1	Private
57	68	35	Lot 1:$N\frac{1}{2}NE\frac{1}{4}$:$W\frac{1}{2}SW\frac{1}{4}$	194.86	Rolling	39	1	VI	1	Private
57	69	1	$NE\frac{1}{4}SW\frac{1}{4}$	40.00	Mountainous	12	1	VII	1	Private
58	62	30	Lot 8:$NE\frac{1}{4}NW\frac{1}{4}$:$NW\frac{1}{4}SE\frac{1}{4}$	119.12	Rolling	24	1	VI	1	Private
58	63	35	$SE\frac{1}{4}SE\frac{1}{4}$	40.00	Rolling	10	1	VI	1	Private
58	64	28	$E\frac{1}{2}NW\frac{1}{4}$:$W\frac{1}{2}NE\frac{1}{4}$:$NW\frac{1}{4}SE\frac{1}{4}$	200.00	Rolling to rough	10	1	VII	1	Private
58	64	29	$NW\frac{1}{4}NE\frac{1}{4}$	40.00	Rolling to rough	2	1	VII	1	Private
58	64	30	Lots 3 and 4	77.67	Rough	0	5-6	VIII	5-6	Private
58	64	32	$S\frac{1}{2}SE\frac{1}{4}$	80.00	Rolling to rough	14	1	VII	1	Private
58	64	33	$W\frac{1}{2}NW\frac{1}{4}$:$N\frac{1}{2}SE\frac{1}{4}$	160.00	Rolling to rough	8	1	VI	1	Private
58	64	34	$NE\frac{1}{4}NE\frac{1}{4}$	40.00	Rolling to rough	2	1	VI	1	Private
58	64	34	$SW\frac{1}{4}NE\frac{1}{4}$:$NW\frac{1}{4}SW\frac{1}{4}$	80.00	Rolling to rough	12	1	VI	1	Private
58	64	34	$SE\frac{1}{4}NW\frac{1}{4}$	40.00	Rolling to rough	4	1	VI	1	Private
58	64	34	$SW\frac{1}{4}SW\frac{1}{4}$	40.00	Rolling	8	1	VI	1	Private
58	68	25	$SW\frac{1}{4}SE\frac{1}{4}$	40.00	Rolling to rough	6	1	VII	1	Private
58	68	27	Lot 4	20.57	Rolling	4	1	VI	1	Private
58	68	35	$E\frac{1}{2}SE\frac{1}{4}$	80.00	Rolling	16	1	VI	1	Private

-Continued

Table 19. - Description, Area, Classification, Suitability and Proposed Management of Unreserved Public Domain, by Counties Within the Little Missouri River Basin, Montana, North Dakota, South Dakota and Wyoming, 1955 - Continued

Summary

States & Counties	Number of Tracts	Total Area Acres	Land Capability Classes in Acres				Recommended Stocking	Recommended Management			
								Federal		Private	
			I to V	VI	VII	VIII	Animal Unit Mos.	Number of Tracts	Acres	Number of Tracts	Acres
Montana:											
Carter	356	40,577.38	2,538	27,677	9,441	921	8,347	5	686	351	39,891.38
Fallon	55	8,052.25	670	2,330	4,981	71	1,485			55	8,052.25
Powder River	4	320.	200		120		64			4	320.
Wibaux	4	239.37	10		229		61			4	239.37
Montana Totals	419	49,189.	3,418	30,007	14,771	992	9,957	5	686	414	48,503.
North Dakota:											
Bowman	96	10,387.34	288	1,651	6,532	1,916	1,589			96	10,387.34
Dunn	81	16,687.53			15,284	1,404	2,687	3	169	78	16,518.53
Golden Valley	13	2,678.25		230	2,448		561			13	2,678.25
McKenzie	5	374.95	8	15	352		130	2	55	3	319.95
North Dakota Totals	195	30,128.07	296	1,896	24,616	3,320	4,967	5	224	190	29,904.07
South Dakota											
Harding	75	6,905.41	362	4,927	1,211	405	1,462	1	40	74	6,865.41
South Dakota Totals	75	6,905.41	362	4,927	1,211	405	1,462	1	40	74	6,865.41
Wyoming:											
Crook	179	10,920.14	50	3,230	7,351	289	1,541			179	10,920.14
Wyoming Totals	179	10,920.14	50	3,230	7,351	289	1,541			179	10,920.14
GRAND TOTAL	868	97,142.62	4,126	40,060	47,949	5,006	17,927	11	950	857	96,192.62

Appendix A

Principal plants growing on range lands of the Little Missouri River Basin. Symbols of these plants are shown on the Land Classification Map, Little Missouri River Basin, Montana, North Dakota, South Dakota and Wyoming, 1958, with this report.

Map Symbol	Scientific Name	Common Name
	Grass	
Ada	Agropyron dasystachyum	Thickspike wheatgrass
Asp	Agropyron spicatum	Bearded bluebunch wheatgrass
Asm	Agropyron smithi	Bluestem wheat grass
Asc	Andropogon scoparius	Little bluestem
Bcu	Bouteloua curtipendula	Sideoats grama
Bgr	Bouteloua gracilis	Blue grama
BRO	Bromus spp.	Brome
Bte	Bromus tectorum	Wheatgrass brome
Bda	Buchloe dactyloides	Buffalograss
Cmo	Calamagrostis montanensis	Plains Reedgrass
Clo	Calamovilfa longifolia	Prairie sandreed
Dst	Distichlis stricta	Inland saltgrass
Hju	Hordeum jubatum	Foxtail barley
Kcr	Koeleria cristata	Prairie junegrass
Mcu	Muhlenbergia cuspidata	Stonyhills (plains) muhly
Pca	Panicum capillare	Common witchgrass
POA	Poa spp.	Bluegrass
Pse	Poa secunda	Sandberg bluegrass
PUC	Puccinellia spp.	Alkaligrass
Spa	Schedonnardus paniculatus	Tumblegrass
Sai	Sporobolus airoides	Alkali sacaton
Sco	Stipa comata	Needle and thread
Svi	Stipa viridula	Green needlegrass

Map Symbol	Scientific Name	Common Name
	Grasslike Plants	
Cel	Carex eleocharis	Needleleaf sedge
Cfi	Carex filifolia	Threadleaf sedge
Car	Carex spp.	Sedge
	Forbs and Weeds	
CHE	Chenopodium spp.	Goosefoot
	Comandra umbellata	Common comandra
	Echinacea angustifolia	Blacksamson echinacea
ERI	Erigeron spp.	Fleabane (wild daisy)
ERO	Eriogonum spp.	Eriogonum
Ela	Eurotia lanata	Common winterfat
	Helianthus rigidus	Stiff sunflower
ALF	Medicago sativa	Alfalfa
PHL	Phlox spp.	Phlox
	Selaginella spp.	Selaginella
SOL	Solidago missouriensis	Missouri goldenrod
Scc	Sphaeralcea coccinea	Scarlet globemallow
Forbs	(Few to several or many miscellaneous forbs)	Forbs
Wds	(Few to several or many miscellaneous weeds)	Weeds
	Trees and Shrubs	
Aca	Artemisia cana	Silver sagebrush
Afr	Artemisia frigida	Fringed sagebrush
Atr	Artemisia tridentata	Big sagebrush
Aga	Atriplex gardneri	Gardner saltbush
Cna	Chrysothamnus nauseosus	Rubber rabbitbrush

Map Symbol	Scientific Name	Common Name
	Trees and Shrubs	
Gsa	Gutierrezia sarothrae	Broom snakeweed
Jsc	Juniperus scopulorum	Rocky Mountain Juniper
Opo	Opuntia polyacantha	Plains pricklypear
OPU	Opuntia spp.	Pricklypear
Ppo	Pinus ponderosa	Ponderosa pine
Sve	Sarcobatus vermiculatus	Black greasewood

Nomenclature from "Standard Plant Names", H. P. Kelsey and W. A. Dayton: published by Horace McFarland Company, Harrisburg, Pennsylvania, 1942.

Form No. 4-1090
(April 1951)

APPENDIX B

UNITED STATES

DEPARTMENT OF THE INTERIOR

BUREAU OF LAND MANAGEMENT

_____, 19_____
(Date of field examination)

LAND CLASSIFICATION REPORT

I. SUMMARY

1. Region _____ State _____ County _____ Serial _____
2. Type of application _____ Applicant _____
3. Land description: T. _____ R. _____ Mer. _____ Acres _____
4. Location and accessibility _____
5. Elevation _____ 6. Annual precipitation _____
7. Topography _____
8. Soil _____
9. Vegetation _____
10. Type and extent of erosion _____
11. Present land uses _____
12. Potential land uses _____
13. Present improvements _____
14. Needed improvements _____
15. (*a*) Value of land, $_____ (*b*) Value of _____, $_____
    (*c*) Value of _____, $_____ Total value, $_____
16. Conflicts _____
17. Does the land contain: (*a*) Mineral _____ (*b*) Hot springs _____ (*c*) Water needed by public? _____
    (*d*) Is it occupied by natives (Alaska)? _____
18. Findings and recommendations:

Prepared by _____
(Title) (Date)

Approved _____
(Title) (Date)

Approved _____
(Title) (Date)

19. Classification

Signed _____
(Title) (Date)

PRIVATE—Not for Public Information

16—60299-2

II. LAND USE FACTORS

A. Crop Factors:

20. Soil .....
21. Precipitation .....
22. Growing season .....
23. Area adaptable for crop production: Total acres .....
    (*a*) By irrigation ..... (*b*) By dry-farming .....
24. Principal crops and average yields on similar lands in locality .....
25. Crop failures in locality .....
    (*a*) Frequency ..... (*b*) Causes .....
26. Extent of farm land abandonment in locality .....
27. Water supply:
    (*a*) Source ..... (*b*) Quality .....
    (*c*) Adequacy ..... (*d*) Dependability .....
28. Feasibility of irrigation development (construction of facilities, water rights, costs, and returns):

29. Minimum acreage required for average farm family unit .....
30. Agricultural rating: (*a*) Good ..... (*b*) Fair ..... (*c*) Poor .....
31. Comments:

B. Grazing Factors:

32. Vegetation (type association) .....
33. (*a*) Density ..... (*b*) Condition .....
34. Principal forage plants .....
35. Nonforage plants .....
36. Present grazing capacity ..... (AUMs); Potential grazing capacity ..... (AUMs)
37. Stock water available: Stream ..... Spring ..... Well ..... Pond ..... Other .....
38. Is this water needed by public? ..... If so, explain .....
39. Treatment, structures, or other changes or improvements necessary for best use and management .....
40. Name and address of lessee .....
41. Comments:

C. TIMBER:

42. Acres timbered:

43.

SPECIES	UNIT	VOLUME	UNIT VALUE	VALUE

44. Total value of timber _____
45. Quality and condition _____
46. Accessibility _____
47. Demand _____
48. Comments:

D. MINERALS:

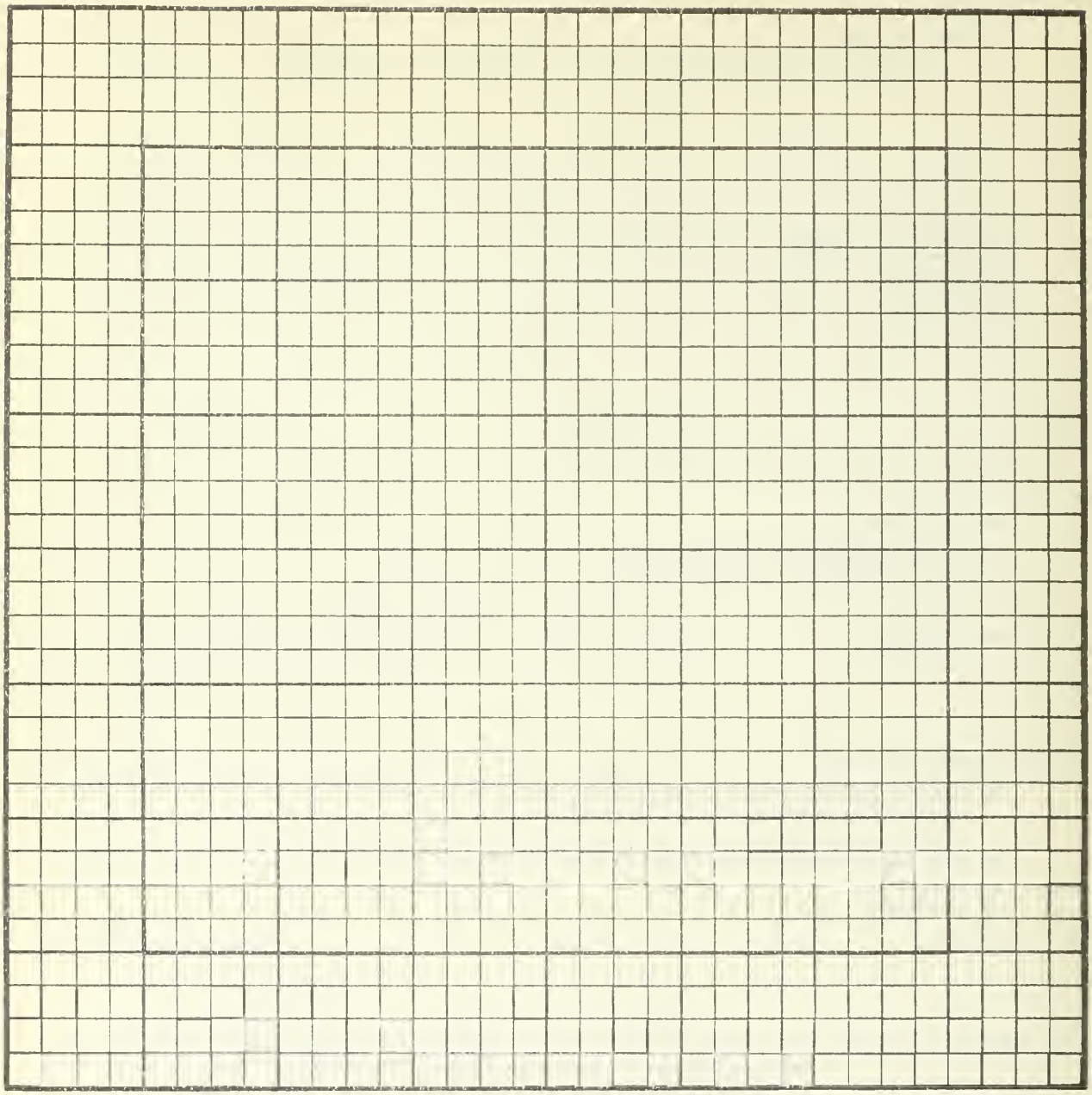
49. (*a*) Metallic _____
(*b*) Nonmetallic _____
50. Extent of development, leases and claims _____
_____
_____
51. Comments:

E. OTHER LAND USE:

52. Does the land have value or adaptability for airfield, wildlife conservation, hunting, community, industrial, homesite, business, recreation, or other? _____
_____
53. Type and ownership of improvements on this and adjacent lands _____
_____
54. Comments:

III. APPRAISAL (55–60).—List evidence of value considered (sales, tax assessments, opinions, rentals, etc.) and state conclusions. Improvements should be appraised separately.

IV. DIAGRAM T. R. M.



Scale: Symbols:

Names and addresses of adjoining owners:

Comments: (This diagram may also be used for a wide variety of larger or smaller scales than the one inch equals one mile as implied. The examiner making the inventory and appraisal selects a scale adapted to the tract or tracts being examined. Data exterior to the tract which is usually shown consists of access, drainage, water supply, adjacent ownership, use and lease or operating unit information. Pertinent adjacent features affecting the use, location or value of the tract are also shown on this diagram.)

(DO NOT WRITE BELOW THIS LINE)

Appendix C - Description and definitions of land-use capability classes 1/

Class	Suitable for	Topography		Characteristic Native Vegetation	Soil Characteristics						Vulnerability to Erosion	Requisite Special Practices
		Slope (percent)	Character of Surface		Texture	Depth	Relative Salinity	Fertility	Productivity	Drainage		
I	Best type of farming land	0 to 2	Level or nearly level	Tall and mid-grasses, thrifty sagebrush, deciduous trees	Medium; Friable	12" or more; subsoil 36" or more	Negligible	High	Good to High	Good to Excellent	Low	None to minor
II	Farming with simple conservation practices	0 to 10	Irregular	Tall, mid, and short grasses; big sagebrush, deciduous trees	Light to Heavy; Friable	8" or more; subsoil 36" or more	Negligible to slight	Good to High	Moderate to High	Good	Slight to moderate	Minor to simple practices
III	Farming with complex conservation practices	0 to 10	Irregular	Tall, mid, and short grasses; big sagebrush, rabbitbrush, greasewood, coniferous, and deciduous trees	Light to Heavy; Friable	6" or more; subsoil 24" or more	Slight to moderate	Fair to Good	Modsrate to High with management	Often poor; may be needed	Moderate to High	Complex practices essential
IV	Limited or occasional cultivation; best for permansnt hay or pasture	0 to 15	Irregular or stony	Tall, mid, and short grassss; big sagebrush, rabbitbrush, greasewood, coniferous, dsciduous trees, saltbush, winterfat	Sandy to Clay; porous or tight	6" or more; may have shallow hardpan	Negligible to critical	Poor to Good	Poor for row crops; best for hay and pasture	Not justifiable if needed	Modsrate to High or nil	Complex and intensive practices with good management
V	Range or woodland; farming only if irrigation water becomes available	0 to 5	Smooth to irregular; may be stony or wet	Tall, mid, and short grasses; big sagebrush, rabbitbrush, greasewood, coniferous, and dsciduous trees	Light to Heavy; Friable	Good permeability to 24" depth	Negligible to moderate	Good to High	Moderate to High	Usually not a problem	Low	None to minor or drainage
VI	Range and woodland only	0 to 20 (greater only on good soils)	Irrsgular to rough or rocky	Tall, mid, and short grasses; big sagsbrush, rabbitbrush, greasewood, coniferous, deciduous trees, saltbush, winterfat	Very Light to Heavy	Shallow to moderate; permeability excessive to poor	Negligible to moderate	Fair to Good	Light to Moderate;	Not practicable if a problem	Moderate	Proper management with simple restrictions
VII	Range and woodland with severe restrictions	0 to 100	Rough, rocky, or eroded	Tall, mid, and short grasses; big sagebrush, rabbitbrush, greasewood, coniferous, deciduous trees, saltbush, winterfat, mountain browse and annuals	Any: May be tight clay or open sand or gravel	Often shallow, poorly developed	Negligible to critical	May be Poor	Poor to Light	Seldom a problem or not practicable	High	Proper management with complex restrictions and intensive practices
VIII	Watershed, wildlife and recreation	Generally steep or swampy	Extremely rough, barren or inaccessible	Often only annuals or scanty perennials; may be dense coniferous timber	Usually poorly developed	Very shallow or nil	May be excessive for plant growth	Usually very low	Usually very low or nil	Often poor;not justifiable if a problem	High (unless a swamp)	Complete protection

1/ Adapted from Soil Conservation Service Standards, U. S. Department of Agriculture. Any one of the factors listed may classify a soil, factors determining classification singly, not necessarily in combination.

Appendix D

Range Type Designations

As shown on the Land Classification Map, Little Missouri River Basin, Montana, North Dakota, South Dakota and Wyoming, 1958, with this report.

Type No.	Type Characteristics	Remarks
1-Grass	Buffalo-grama, bluestem wheatgrass, Junegrass, needlegrasses, prairie sandreed, bunch grasses, alpine grassland, sedges.	Grassland
2-Meadow	Meadow grasses and sedges; bluestem wheatgrass; high density; high production. Land usually level or nearly so, with extra moisture from overflow, runoff, or seepage, or in a high precipitation area.	Wet or dry meadows
3-Weeds	Perennial weeds; untimbered areas	Frequently is a result or overuse or other site damage.
4-Sagebrush	Big sagebrush, silver sagebrush, other sagebrush by appearance or aspect	Big sagebrush Silver sagebrush Sand sagebrush
5-Mountain Shrub	Browse and shrubs(except sagebrush)usually makes up most of the vegetal cover; at least dominates the aspect of the type.	Mountain mahogany, ceanothus
6-Conifer	Woodland type in the Missouri River Basin at lower elevations is usually Ponderosa Pine;at least, in aspect. At high elevations, may be lodgepole pine, Engleman spruce, Douglas fir; may also contain browse, shrubs, grasses and weeds, Big sagebrush, Green needlegrass, Ponderosa pine.	Pine, fir, or spruce cover or aspect

-Continued

Range Type Designations - Continued

Type No.	Type Characteristics	Remarks
7-Waste	No grazing or slight value for grazing; not barren. Cover not palatable, or prevents use; may not be accessible.	Large areas of very sparse forage.
8-Barren	Lake beds, sand dunes, saline flats, lava flows, rock peaks, and slopes.	To be differentiated from waste land.
9-Juniper	Rocky Mountain Juniper; outside of the Missouri Basin, this type is called Pinion-Juniper and includes Pinon and Digger Pine, Utah and other Juniper.	May have stand of grass and shrubs, or may be almost pure Juniper.
13-Saltbush: Atriplex	Atriplex dominant, separate from Desert Shrub; Gardner saltbush	Atriplex is sufficiently dominant to show type.
14-Grease-wood	Sarcobatus is dominant, at lease in aspect; stream margins; saline flats.	Overflow areas with saline soils.

APPENDIX E

TECHNICIANS GUIDE TO RANGE SITES, CONDITION CLASSES, AND RECOMMENDED STOCKING RATES

Utilized by the Missouri River Basin Investigations Field Group of the Bureau of Land Management for the inventory studies of the Little Missouri River Basin, 1954 - 1955. Compiled from the Technicians Guide for Miles City, Montana and vicinity, produced by the Soil Conservation Service, U.S.D.A., October 1953. CS, clay-shale is a site which has been added because of its prevalence in this basin.

PART 1: Key Species and their responses to grazing as judged from climax

DECREASERS	INCREASERS (By Range Sites)	Maximum % in Climax																										INVADERS
		15"-19"								10"-14"																		
		WL	Ld	OU	Cl	SS	Sw	VS	Sh	WL	Ld	SL	Sa	Sy	OU	Cl	Sw	Sc	SS	TB	Gr	VS	SU	Sh	CS	Bl	
Big bluestem	Western wheatgrass)																										All annuals
Switchgrass	Thickspike wheatgrass)	-	20	30	45	d	d	d	d	10	30	d	d	30	40	50	40	d	d	d	d	d	d	d	50	d	Canada bluegrass
Giant wildrye	Needleandthread	-	-	20	20	25	d	d	d	-	-	-	40	35	30	d	d	d	d	d	d	d	d	d	d	d	Kentucky bluegrass
Cordgrasses	Prairie Junegrass	-	-	15	15	d	d	d	d	-	-	d	10	10	15	15	15	10	10	10	d	d	d	d	d	d	All other exotics
Canada wildrye	Blue grama	-	-	5	5	5	10	15	20	-	-	-	5	5	10	10	15	15	5	20	20	35	30	d	10	25	Curlycup gumweed
Prairie sandreed	Sandberg bluegrass	-	-	5	5	5	5	5	5	-	-	-	5	5	5	5	5	5	5	5	5	10	10	10	5	10	Broom snakeweed
Bluebunch wheatgrass	Bottlebrush squirreltail	-	-	-	-	-	-	-	-	-	-	5	-	-	-	5	-	5	-	5	5	5	10	10	10	10	Tumblegrass
Montana wheatgrass	Perennial threeawns	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	5	10	10	-	5	Dandelion
Slender wheatgrass	Threadleaf sedge	-	-	10	10	10	10	10	15	-	-	-	20	15	5	-	10	-	10	20	15	20	d	d	-	20	Foxtail barley
Bearded wheatgrass	Other sedges	50	10	5	5	5	5	5	10	40	10	10	5	5	5	5	5	5	5	5	5	10	10	d	5	10	Rabbitbrush
Green needlegrass	Buffalograss	-	-	-	-	-	-	-	-	-	-	-	-	-	5	5	5	-	-	-	-	5	-	d	5	d	Western ragweed
Tall reedgrasses	Stonyhills muhly	-	-	-	-	5	10	15	15	-	-	-	-	-	5	5	10	-	10	10	15	d	d	d	d	d	Verbena
Idaho fescue	Saltgrass	-	-	-	-	-	-	-	-	-	-	20	-	-	-	-	-	10	-	-	-	-	20	5	-	5	Bull thistle
Indian ricegrass	Plains reedgrass	-	-	10	10	d	d	d	d	-	-	-	-	5	10	10	10	d	d	d	d	d	d	d	10	d	Green sagewort
Sand dropseed	Fringed sagewort	-	-	-	-	-	-	5	-	-	-	-	-	5	-	-	5	-	5	5	5	5	-	-	-	5	
Little bluestem	Phlox	-	-	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	5	5	5	-	-	-	-	
Canby bluegrass	Pricklypear	-	-	-	-	-	-	-	5	-	-	-	5	5	-	-	5	5	-	-	-	-	5	-	-	-	
Alkali sacaton	Snowberry	-	5	-	-	5	-	5	-	-	5	-	-	-	-	-	-	-	5	-	-	-	-	-	-	-	
Nuttall alkaligrass	Silver sagebrush	-	5	5	5	-	-	-	-	-	5	-	-	5	-	-	5	5	-	-	-	5	5	-	-	-	
Sideoats grama	Big sagebrush	-	5	5	5	5	-	5	5	-	5	-	-	-	5	5	-	-	-	5	5	5	-	-	5	5	
Forb decreasers	Greasewood	-	-	-	-	-	-	-	5	-	-	10	-	-	-	-	-	-	-	-	-	-	5	5	-	-	
Woody decreasers	Conifers	-	-	-	-	20	-	15	5	-	-	-	-	-	-	-	-	-	15	-	-	10	-	-	-	5	
	Winterfat	-	-	-	-	-	-	-	-	-	-	d	-	-	5	d	d	d	d	d	d	d	d	d	d	d	
	Gardner saltbush	-	-	-	-	-	-	-	-	-	-	10	-	-	-	-	d	d	-	d	-	-	d	d	10	5	
	Other woody plants	20	10	-	-	10	-	5	10	10	5	-	-	-	-	-	-	-	10	-	5	5	5	5	5	5	

The symbol "-" means the species has less than 2½% coverage or is not in the climax for the site. The symbol "d" means the species is a decreaser on this site. WL - Wet Land is w1 - w3 (subirrigated); Ld - Lowland is f1 - f3 overflowed (use the lowland guide to determine condition and stocking of native pasture areas with water spreading systems. Map separately and label separately as Water Spreading System); SL - Saline Lowland is p4 - p5, S2 - S4 with f1 to f3 overflow and/or w1 to w2; Sa - Sands is L to C texture, 1-3 depth; Sy - Sandy is S texture, 1 to 3 depth; OU - Ordinary Upland is F to M texture, 1-3 depth, Cl - Clay is V - H textures, 1 - 3 depth; Sw-Shallow is 4 depth, (deeper rooting generally impossible because of no deeper moisture storage or a restrictive layer) without f, w, S or p factors. Sc - Scabland (solodized-solonetz with B horizon exposed in spots on not less than 20% of the area) is X depth, H - S texture. 3-4 upper and 1-3 lower permeability, p4 - p5; SS - Savannah Site (originally had isolated trees) is 1-3 depth, with F to C textures at margins of forest climates and soils; or with r, v, or c textures in grassland climates 4 to 7 upper permeability with 1 to 4 lower permeability; TB - Thin Breaks is al surface on slopes over 15 percent; Gr - Gravel is 2, 6 to 7 permeability; VS - Very Shallow is 5 depth, except shale site, (Usually has some joints in the base rock that develop deep soil pockets which are commonly marked by tall grass, shrub or tree growth); SU - Saline Upland is p4 - p5, S2 to S4 1 -2 permeability; Sh - Shale is 5 depth, V or H textures over K; CS - Clay-shale is 2-5 depth, V or H textures over K; this is a special site within the area which is better than shale but not as good as clay; Bl - Badlands is rough broken and intermingled with Class VIII land.

Part II: Recommended Stocking Rates Based on Precipitation Belt, Site, and Range Condition in Percent. For Sands, Sandy Ordinary Upland, Clay and Savannah Sites use the values in line with the precipitation belt of the site. For Wet Lands double the values for the 25"-29" belt. For Lowland use values of next higher precipitation belt. For Saline Lowland go up ½ precipitation belt except on p5 areas go down one or more belts. For Shallow and Scabland sites go down ½ precipitation belt. On Gravel, Very Shallow, Thin Breaks, and Saline Upland use values of next lower precipitation belt. On Shale or Badland go down two or more precipitation belts.

Precipitation Belt	Range Condition Percentages			
	100	75	50	25
(Inches)	(Animal Unit Months Per Acre)			
30 - 34	1.2	.9	.6	.3
25 - 29	1.0	.75	.5	.25
20 - 24	.8	.6	.4	.2
15 - 19	.6	.45	.3	.15
10 - 14	.4	.3	.2	.1
5 - 9	.2	.15	.1	.05

The range soil categories are described with determinant Standard Symbols for Conservation Surveys of the S. C. S. published in 1951.

Appendix F

Table 20. - Comparison of Agriculture, Population, and Education, Labor Force and Housing of the Little Missouri River Basin in Montana, North Dakota, South Dakota and Wyoming with the United States, 1950

Basic Economic Factors	Value Expressed as	United States	Little Missouri River Basin	Deviation of Basin from United States (percent)
Agriculture:				
Farms operated by tenants	Percent	26.8	13.6	-49.3
Farm-operator family level-of-living index 1/	Figure	122.0	118.0	- 3.3
Total sales all farm products: per commercial farm, dollars	Avg.	5,954.0	6,800.0	+14.2
per farm, all farms, dollars	Avg.	4,097.0	6,423.0	+56.8
Population and Education:				
Population, non-white	Percent	10.5	0.1	-99.0
Age	Median	30.2	27.7	- 8.3
School yrs. completed, persons 25 yrs. old and over	Median	9.3	8.8	- 5.4
Persons 7 to 13 yrs. old, enrolled in school	Percent	95.7	95.6	- .1
Persons 14 to 17 yrs. old, enrolled in school	Percent	83.7	77.2	-77.7
Persons 25 yrs. old and over who completed less than 5 grades	Percent	11.1	6.3	-43.2
Persons 25 yrs. old and over who completed high school or more	Percent	34.3	27.4	-20.1
Labor Force:				
Employed in agriculture	Percent	12.2	60.0	+391.8
Employed in manufacturing	Percent	25.9	1.4	-94.6
Males 14 yrs. and over	Percent	78.7	84.9	+78.8
Females 14 yrs. and over	Percent	28.9	20.6	-28.7

(continued)

Table 20. - Comparison of Agriculture, Population, and Education, Labor Force and Housing of the Little Missouri River Basin in Montana, North Dakota, South Dakota and Wyoming with the United States, 1950 - Continued

Basic Economic Factors	Value Expressed as	United States	Little Missouri River Basin	Deviation of Basin from United States (percent)
Housing:				
Value of dwelling Unit structure, owner occupied, non-farm, dollars	Median	7,344.0	4,550.0	-38.0
Gross monthly rent, non-farm, dollars	Median	42.47	40.33	- 5.0
No. of persons per unit, occupied dwellings	Median	3.1	3.1	none
No. of rooms per unit, all dwellings	Median	4.6	4.3	- .7
Structures built in 1940 or later	Percent	20.7	14.6	-29.5
Dwellings with hot running water private bath and not delapidated	Percent	63.1	22.8	-63.9
Occupied dwellings with central heating	Percent	50.4	23.8	-52.8
Occupied dwellings, occupied by non-white households	Percent	8.8	0.2	-97.7
Electric bill of farm families with electricity(monthly)($)	Avg.	7.4	10.2	+37.8

1/ "The four items on which the farm operator level-of-living indexes are based are the following:(1) percentage of farms with electricity; (2) percentage of farms with telephones; (3) percentage of farms with automobiles; and (4) average value of products sold or traded in the year preceeding the census per farm reporting(adjusted for changed in purchasing power of the farmers dollar)."

Data has been compiled from statistics for each county within the basin area. County figures have been reduced in proportion to the area of the county within the basin, from which the total figures in this table were derived. Data is reliable only on a proportionate county basis and not strictly on a definite locale-boundary basis within the basin area.

Compiled from Bureau of the Census, County and City Data Book, 1952, U. S. Department of Commerce, Bureau of the Census, Washington, D. C., 1953.

Table 21.- Farm characteristics and income, livestock numbers and sales, and harvested area of nine crops in the five principal counties of the Little Missouri River Basin, Montana and North Dakota, 1944 - 1954

	Montana	North Dakota					
	Carter County	Billings County	Golden Valley County	McKenzie County	Slope County	Total or Average	
Part of County in the Basin, %	73	71	95	64	63	71	Average
Total County Area, acres	2,120,320	728,960	648,960	1,798,400	784,640	6,081,280	Total
Land in farms, 1954	1,521,278	497,256	551,349	1,305,775	591,820	4,467,478	Total
1949	1,644,473	372,408	530,193	1,193,921	611,225	4,352,220	
1944	1,745,836	424,640	507,363	1,064,531	618,891	4,361,261	
Average size of farm, 1954	3,481.2	1,385.1	1,300.4	1,085.4	1,324	1,715.2	Average
1949	3,720.5	980.0	1,132.9	967.5	1,340.4	1,628.3	
1944	3,363.8	1,114.5	1,088.8	793.8	1,206.4	1,513.5	
Value of land, 1954	45,150	25,358	31,294	28,020	27,197	31,404	Average
& buildings 1949	29,295	15,007	20,869	17,292	21,838	20,860	
Average per farm, dollars, 1944	13,227	8,414	14,427	8,660	10,479	11,041	
Average per acre, dollars, 1954	12.64	20.07	24.82	29.49	19.71	21.35	Average
1949	7.33	15.40	19.08	19.21	15.81	76.83	
1944	3.93	7.55	13.25	10.91	8.69	44.33	
Irrigated land, number farms, 1954	27	2	3	174	2	208	Total
1949	20	2	-	173	-	195	
1944	1	-	-	157	-	158	
Acres irrigated, 1954	1,991	95	237	19,729	48	22,100	Total
1949	3,133	54	-	19,856	-	23,043	
1944	30	-	-	16,473	-	16,503	
Type of farms:							
Cash grain, 1954	35	120	308	562	238	1,263	Total
1949	3	92	279	638	176	1,188	
Dairy, 1954	-	-	5	16	10	31	Total
1949	1	5	11	-	29	46	
Livestock, 1954	357	196	63	377	145	1,138	Total
1949	388	222	97	352	177	1,236	
General farms, number, 1954	19	30	29	136	29	243	Total
1949	14	36	46	168	52	316	
Primarily crop, number, 1954	13	2	-	41	-	56	Total
1949	5	-	1	25	5	36	
Primarily livestock, no., 1954	-	12	3	8	5	28	Total
1949	6	-	-	15	-	21	
Crop & livestock, no., 1954	6	16	26	87	24	159	Total
1949	3	36	45	128	47	259	
Commercial farms:							
Class I ($25,000 or more sales)							
number, 1954	35	1	7	34	6	83	Total
1949	26	2	7	34	10	79	
Class II ($10,000 - $24,999 sales)							
number, 1954	105	19	85	172	30	411	Total
1949	100	31	46	152	74	403	
Class III ($5,000 - $9,999 sales)							
number, 1954	105	51	130	312	126	724	Total
1949	145	92	119	362	107	825	
Class IV ($2,500 - $4,999 sales)							
number, 1954	94	111	110	328	151	794	Total
1949	84	99	162	269	147	761	
Class V ($1,200 - $2,499 sales)							
number, 1954	59	135	65	186	82	527	Total
1949	37	84	77	252	77	527	
Class VI ($250 - $1,199 sales)							
number, 1954	13	29	13	84	27	166	Total
1949	14	47	33	107	19	220	

-Continued

Table 21. - Farm characteristics and income, livestock numbers and sales, and harvested area of nine crops in the five principal counties of the Little Missouri River Basin, Montana and North Dakota, 1944 - 1954 - Continued

Value of products sold:		Montana		North Dakota			Total or Average	
		Carter County	Billings County	Golden Valley County	McKenzie County	Slope County		
All products, dollars,	1954	4,437,581	1,385,460	2,894,639	7,510,832	2,369,947	18,598,459	Total
	1949	4,210,252	1,831,983	2,781,709	7,385,223	2,932,894	19,142,061	
	1944	2,467,755	1,450,947	3,241,424	7,005,028	2,911,499	17,076,653	
All crops, dollars,	1954	547,601	473,278	2,045,254	4,002,658	1,247,127	8,315,918	Total
	1949	283,451	458,552	1,521,738	3,991,638	1,346,193	7,601,572	
	1944	173,783	721,153	2,378,577	5,143,048	1,891,139	10,307,700	
All livestock & livestock products, dollars,	1954	3,886,454	912,182	849,235	3,506,648	1,122,820	10,277,339	Total
	1949	3,926,615	1,373,411	1,259,971	3,388,903	1,586,701	11,535,601	
	1944	2,292,994	729,794	862,847	1,859,133	1,020,157	6,764,925	
Livestock:								
Horses, number,	1954	2,457	1,220	622	3,358	814	8,471	Total
	1949	3,271	2,090	1,323	4,372	1,169	12,225	
	1944	4,950	3,412	1,600	7,398	2,462	19,822	
Cattle, number,	1954	45,207	31,800	23,835	80,357	29,449	210,648	Total
	1949	28,260	22,563	15,401	53,833	21,405	141,462	
	1944	28,981	24,485	15,610	54,649	21,435	145,160	
Sheep, number,	1954	141,336	854	7,116	20,236	9,774	179,316	Total
	1949	95,939	936	2,146	9,717	5,041	113,779	
	1944	189,975	2,405	16,660	11,351	22,929	243,320	
Sales, alive, dollars,	1954	3,152,833	824,683	732,209	3,202,083	976,437	8,888,245	Total
(All livestock)	1949	3,418,784	1,299,977	1,147,280	3,174,872	1,454,658	10,495,571	
Cattle & calves, dollars,	1954	1,947,569	795,199	604,866	2,876,303	843,898	7,067,835	Total
	1949	2,146,132	1,225,850	943,802	2,850,956	1,301,885	8,468,625	
Sheep & lambs, dollars,	1954	1,150,632	3,417	47,875	248,601	60,846	1,511,371	Total
	1949	1,122,130	9,407	48,915	180,516	57,020	1,417,988	
Area of crops harvested, acres:								
Corn	1954	6,226	7,999	21,089	15,738	16,046	67,098	Total
	1949	1,212	5,209	12,068	16,567	7,710	42,766	
	1944	6,367	5,394	20,014	14,137	10,619	56,531	
Wheat	1954	25,708	37,274	79,959	150,946	88,887	382,774	Total
	1949	14,545	40,961	101,730	194,654	103,869	455,759	
	1944	10,420	39,285	99,393	184,972	98,657	432,727	
Oats	1954	3,800	8,066	8,833	18,643	9,703	49,045	Total
	1949	1,002	2,581	2,649	8,402	2,559	17,193	
	1944	6,858	9,365	8,772	25,246	12,793	63,034	
Barley	1954	5,280	5,350	14,770	17,337	13,450	56,187	Total
	1949	2,710	2,536	3,940	4,961	3,434	17,581	
	1944	6,985	9,042	12,163	23,480	17,833	69,503	
Rye	1954	-	3,901	91	4,706	2,788	11,486	Total
	1949	175	509	-	388	67	1,139	
	1944	1,064	336	10	498	414	2,322	
Flax	1954	-	5,034	8,653	28,574	17,454	59,715	Total
	1949	1,363	3,232	4,874	12,448	11,281	33,198	
	1944	282	1,641	5,155	11,161	2,839	21,078	
Hay, all tame	1954	35,649	19,704	11,675	49,386	22,334	138,748	Total
	1949	21,199	12,192	7,411	34,208	11,588	86,598	
	1944	16,892	7,732	7,695	25,528	12,414	70,261	
Hay, wild	1954	22,242	8,257	10,736	36,695	9,343	87,273	Total
	1949	27,813	14,961	14,626	47,317	22,584	127,301	
	1944	51,030	17,008	9,422	32,439	21,084	130,983	
Potatoes, Irish	1954	12	25	753	284	44	1,118	Total
	1949	7	27	1,049	808	25	1,916	
	1944	122	99	314	1,587	140	2,262	
Total above crops, except wild hay:	1954	76,675	87,353	145,823	285,614	170,706	766,171	
	1949	42,213	67,247	133,721	272,436	140,533	656,150	
	1944	48,990	72,894	153,416	286,609	155,709	717,618	

Compiled from 1954, 1950 and 1945 Census of Agriculture, U. S. Department of Commerce, Bureau of the Census, Washington, D. C. 1956, 1952 and 1947. Part within the basin area, total and averages have been computed by the Bureau of Land Management.

Appendix H

ESTIMATES OF ECONOMIC RETURNS FROM BUREAU OF LAND MANAGEMENT RANGE WATERSPREADING SYSTEMS AT ALZADA, MONTANA

Estimates and computations made by Tom I. Dudley, former District Manager, Bureau of Land Management and W. P. Shanahan, Appraiser, Federal Land Bank.

ALZADA WATERSPREADERS:

		Cost
Original construction 1944 and 1946		
760 acres receive benefits from waterspreading		$3300
Carrying capacity prior to construction	120 AUM's	
Carrying capacity, 1948	420 AUM's	
1948 140 acres ripped		692
1948 Maintenance work and new construction		460
1950 Ripping & reseeding 60 acres		482
1950 Maintenance work and new construction		272
Total cost to date		$5206

1951 900 acres receive benefits from waterspreading and ripping.
Carrying capacity 564 AUM's or 47 animal units year long.

Total cost per acre	$ 5.79
Total cost per animal unit of increased carrying capacity	140.70

Compared to present purchase price of $250 to $300 per animal unit, land investment for partially improved land leaves a decided saving per animal unit by land development.

KLINTWORTH WATERSPREADERS:

Construction - 1948 195 acres benefited by waterspreading and ripping.
Carrying capacity prior to construction 36 AUM's or 3 head year long.
Carrying capacity estimated July 18, 1951 - 180 AUM's or 15 head year long.

Original cost of construction, 1948	$ 982
Ripping, seeding & new construction of one dike(1951)	238
Total cost	$1220
Total cost per acre	6.37

Total cost per animal unit of increased grazing capacity, $101.67, compared to recent sales of partially improved land at $250 to $300 per head land investment.

HALE WATERSPREADERS:

580 acres benefited by waterspreading.
Carrying capacity prior to construction - 120 AUM's or 10 head year long.
*Carrying capacity computed July 19, 1951 - 785 AUM's or 65 head year long.

Original cost of construction	$3087
Maintenance and new construction	563
Total cost	$3650
Total cost per acre	6.30
Total cost per animal unit of increased carrying capacity	66.37

*Based on actual use figures submitted by Mr. C. Kent Hale, the operator.

MISSOURI RIVER BASIN INVESTIGATIONS
BILLINGS, MONTANA

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT—REGION 3
DIVISION OF LANDS

LITTLE MISSOURI RIVER BASIN PUBLIC DOMAIN MAP

MONT — N. DAKOTA — S. DAKOTA — WYOMING

APRIL 1954

SCALE OF MILES

LEGEND

- Vacant Public Domain (Landownership revised to Jan.,1955)
- Stock driveway withdrawal
- Public Domain withdrew for Land Utilization Project.
- Repurchased Lands by Dept. of Agriculture
- Public Water Reserve
- Vacant Public Domain proposed for transfer to Dept. of Army
- Lands transfered to Dept. of Army

Revision of Vacant Public Domain Landownership by Area 3, Denver Drafting Office, August, 1958

MISSOURI

R 99 W. R.98W R.97W R.96W R.95W R 94W R.93W.

T. 153 N.

T. 152 N. FORT BERTHOLD INDIAN RES.

T. 151 N.

T. 150 N.

RIVER

T. 149 N.

MCKENZIE CO. DUNN CO.

R. 102 W. R.101W R.100W R.99W R.98W R.97W R.96W R.95W R.94W R.93W. R.92W R. 91W.

T. 148 N. BERTHOLD INDIAN RESERVATION

T. 147 N.

T. 146 N.

T. 145 N.

GREAT NORTHERN R.R.

WATFORD CITY

JOHNSON'S CORNER

CROFT

THEODORE ROOSEVELT LITTLE NATIONAL MEMORIAL PARK

GRASSY BUTTE

TO KILLDEER

MCKENZIE CO.

Joins Sheet 2

GPO 857029

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT—REGION 3
DIVISION OF LANDS

LITTLE MISSOURI RIVER BASIN PUBLIC DOMAIN MAP

MONT—N. DAKOTA—S. DAKOTA—WYOMING

APRIL 1954

SCALE OF MILES

LEGEND

- Vacant Public Domain (Landownership revised to Jan., 1955.
- Stock driveway withdrawal
- Public Domain withdraw for Land Utilization Project.
- Repurchased Lands by Dept of Agriculture
- Public Water Reserve
- Vacant Public Domain proposed for transfer to Dept. of Army
- Lands transfered to Dept. of Army

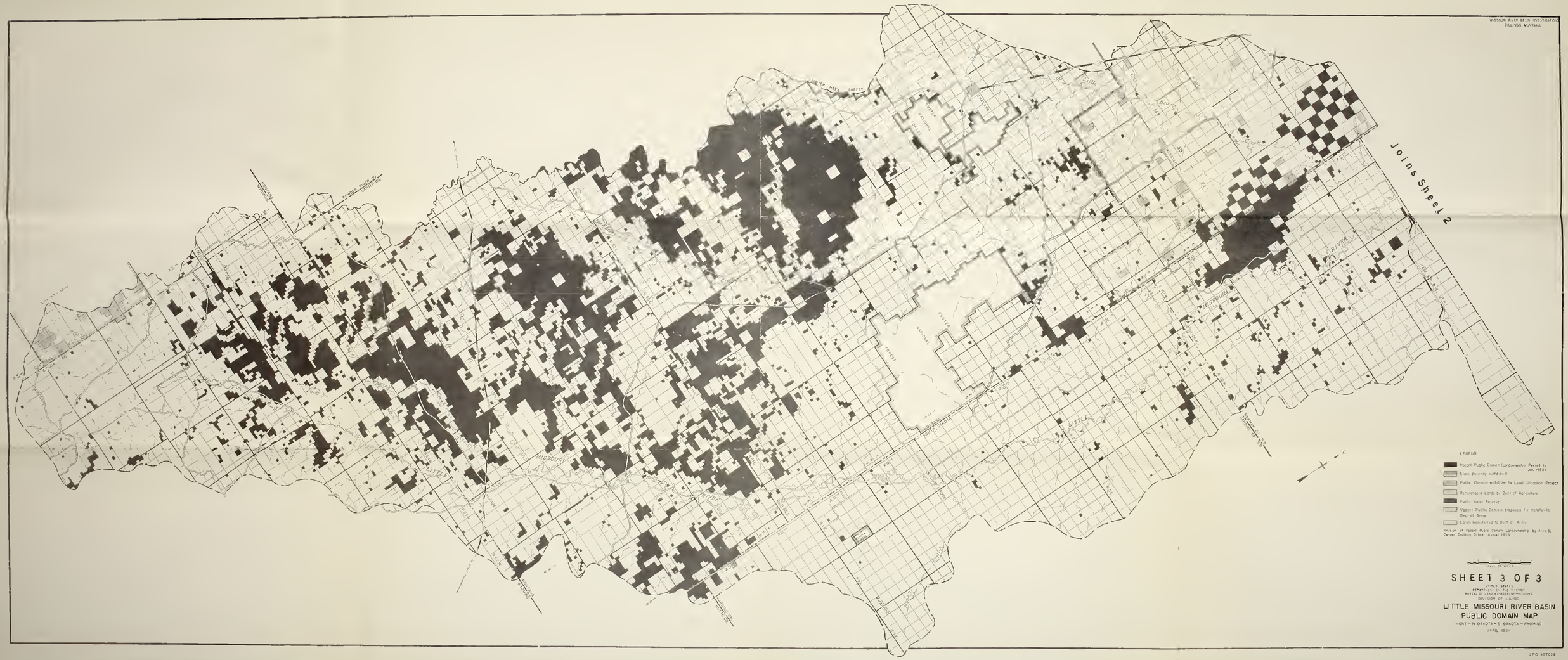
Revision of Vacant Public Domain Landownership by Area 3, Denver Drafting Office, August 1958

MISSOURI RIVER BASIN INVESTIGATIONS
BILLINGS, MONTANA

Joins Sheet 1

Joins Sheet 3

GPO 857029


MISSOURI RIVER BASIN INVESTIGATIONS
BILLINGS, MONTANA
Joins Sheet 2
LEGEND
Vacant Public Domain (Landownership Revised to Jan. 1953)
Stock driveway withdrawal
Public Domain withdrawn for Land Utilization Project
Reforestation Lands by Dept of Agriculture
Public Water Reserve
Vacant Public Domain proposed for transfer to Dept of Army
Lands transferred to Dept of Army
Acreage of Vacant Public Domain Landownership by Area 3, Denver District Office - August 1953
SCALE OF MILES
SHEET 3 OF 3
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT-MISSION 3
DIVISION OF LANDS
LITTLE MISSOURI RIVER BASIN
PUBLIC DOMAIN MAP
MONT.—N. DAKOTA—S. DAKOTA—WYOMING
APRIL 1954
GPO 857028

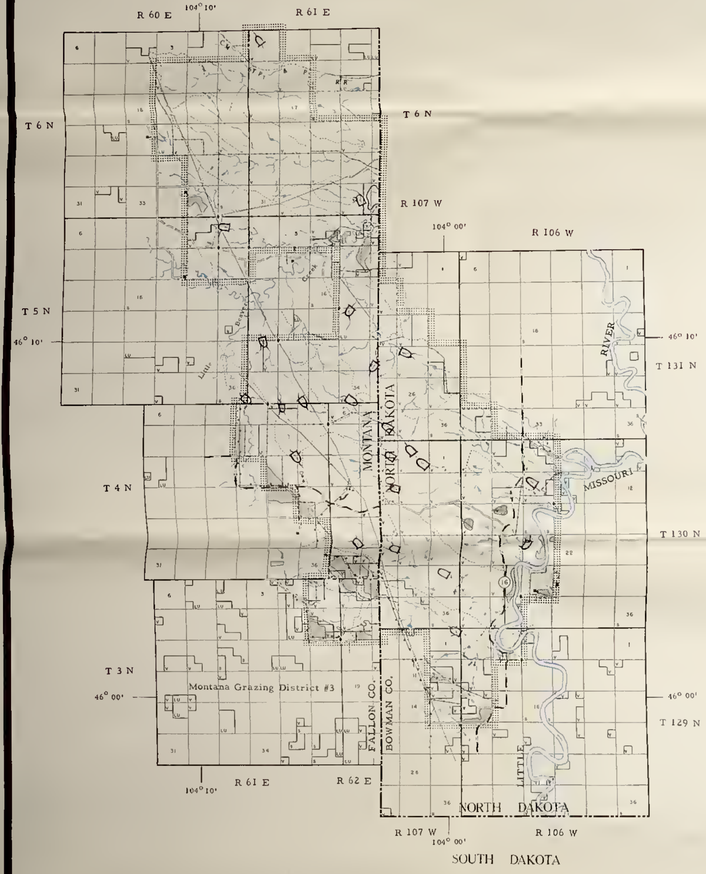
UNITED STATES
DEPARTMENT OF THE INTERIOR

BUREAU OF LAND MANAGEMENT
AREA 3

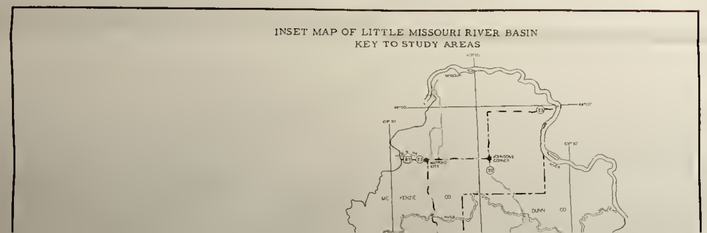
LITTLE MISSOURI RIVER BASIN

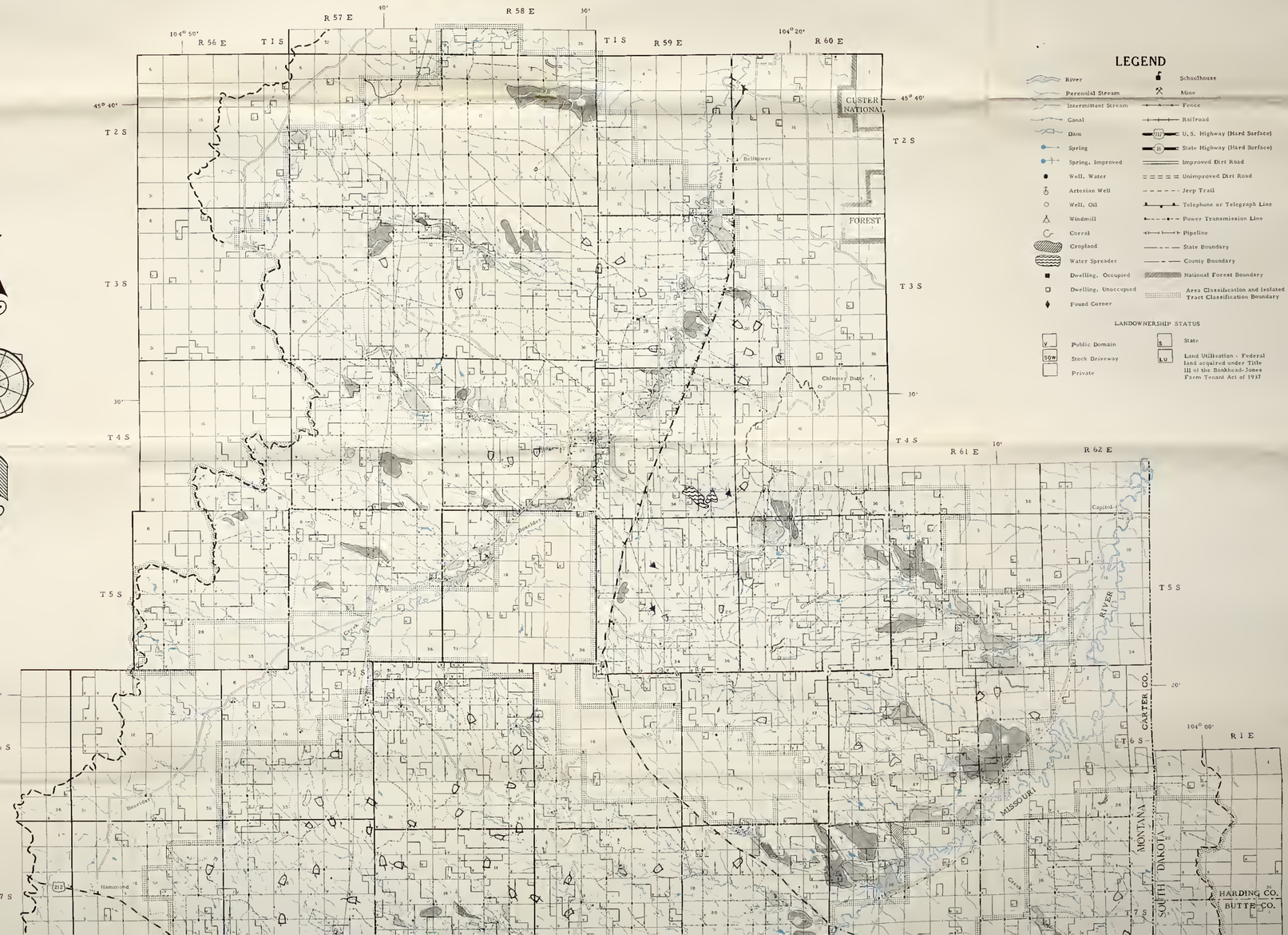
MONTANA, NORTH DAKOTA, SOUTH DAKOTA & WYOMING

0 1 2 3 4 5 6
Scale in Miles



NORTH STUDY AREA





LEGEND

- River
- Perennial Stream
- Intermittent Stream
- Canal
- Dam
- Spring
- Spring, Improved
- Well, Water
- Artesian Well
- Well, Oil
- Windmill
- Corral
- Cropland
- Water Spreader
- Dwelling, Occupied
- Dwelling, Unoccupied
- Found Corner
- Schoolhouse
- Mine
- Fence
- Railroad
- U.S. Highway (Hard Surface)
- State Highway (Hard Surface)
- Improved Dirt Road
- Unimproved Dirt Road
- Jeep Trail
- Telephone or Telegraph Line
- Power Transmission Line
- Pipeline
- State Boundary
- County Boundary
- National Forest Boundary
- Area Classification and Isolated Tract Classification Boundary

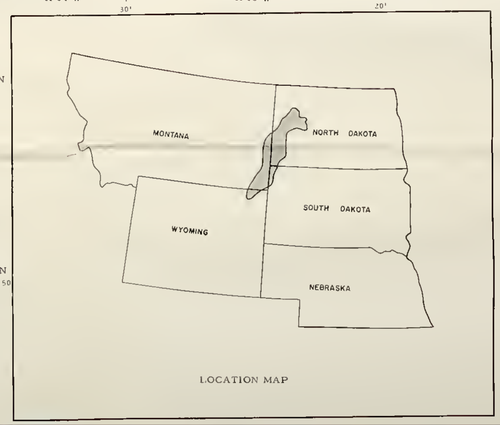
LANDOWNERSHIP STATUS

- V — Public Domain
- SDW — Stock Driveway
- Private
- S — State
- LU — Land Utilization - Federal land acquired under Title III of the Bankhead-Jones Farm Tenant Act of 1937

NORTH STUDY AREA

INSET MAP OF LITTLE MISSOURI RIVER BASIN
KEY TO STUDY AREAS

SOUTH STUDY AREA



LOCATION MAP

POTENTIAL IMPROVEMENT SITES

- Dam
- Water Spreader
- Rodent Control (Prairie Dog)
- Reseed
- Check Dam

MISSOURI RIVER BASIN INVESTIGATIONS
AREA 3
Denver Drafting Office
Denver, Colorado
J. O. M. 1958 M. G. C.

UNITED STATES
DEPARTMENT OF THE INTERIOR

BUREAU OF LAND MANAGEMENT
AREA 3

LITTLE MISSOURI RIVER BASIN

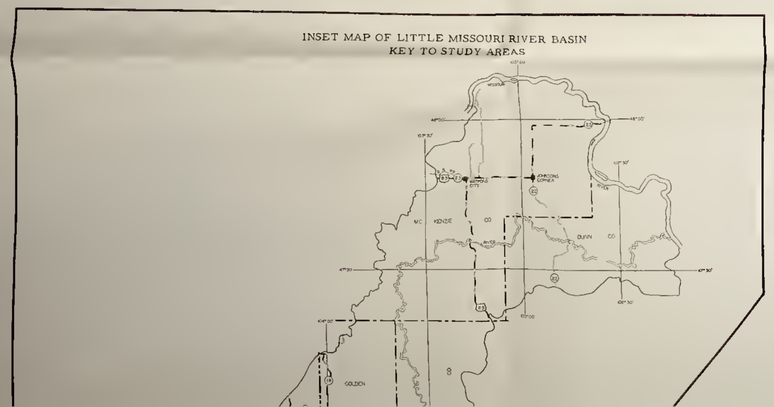
MONTANA, NORTH DAKOTA, SOUTH DAKOTA & WYOMING

0 1 2 3 4 5 6
Scale in Miles

NORTH STUDY AREA

SOUTH DAKOTA

INSET MAP OF LITTLE MISSOURI RIVER BASIN
KEY TO STUDY AREAS



LEGEND

- River
- Perennial Stream
- Intermittent Stream
- Canal
- Dam
- Spring
- Spring, Improved
- Well, Water
- Artesian Well
- Well, Oil
- Windmill
- Corral
- Cropland
- Water Spreader
- Dwelling, Occupied
- Dwelling, Unoccupied
- Found Corner

LANDOWNERSHIP STATUS

- Public Domain
- Stock Driveway
- Private
- State
- Land ... land ... ill of ... Farm

- School
- Mine
- Fence
- Railr...
- U.S. ...
- State ...
- Impr...
- Unim...
- Jeep ...
- Tele...
- Powe...
- Pipel...
- State ...
- Coun...
- Natio...
- Area ... Trac...

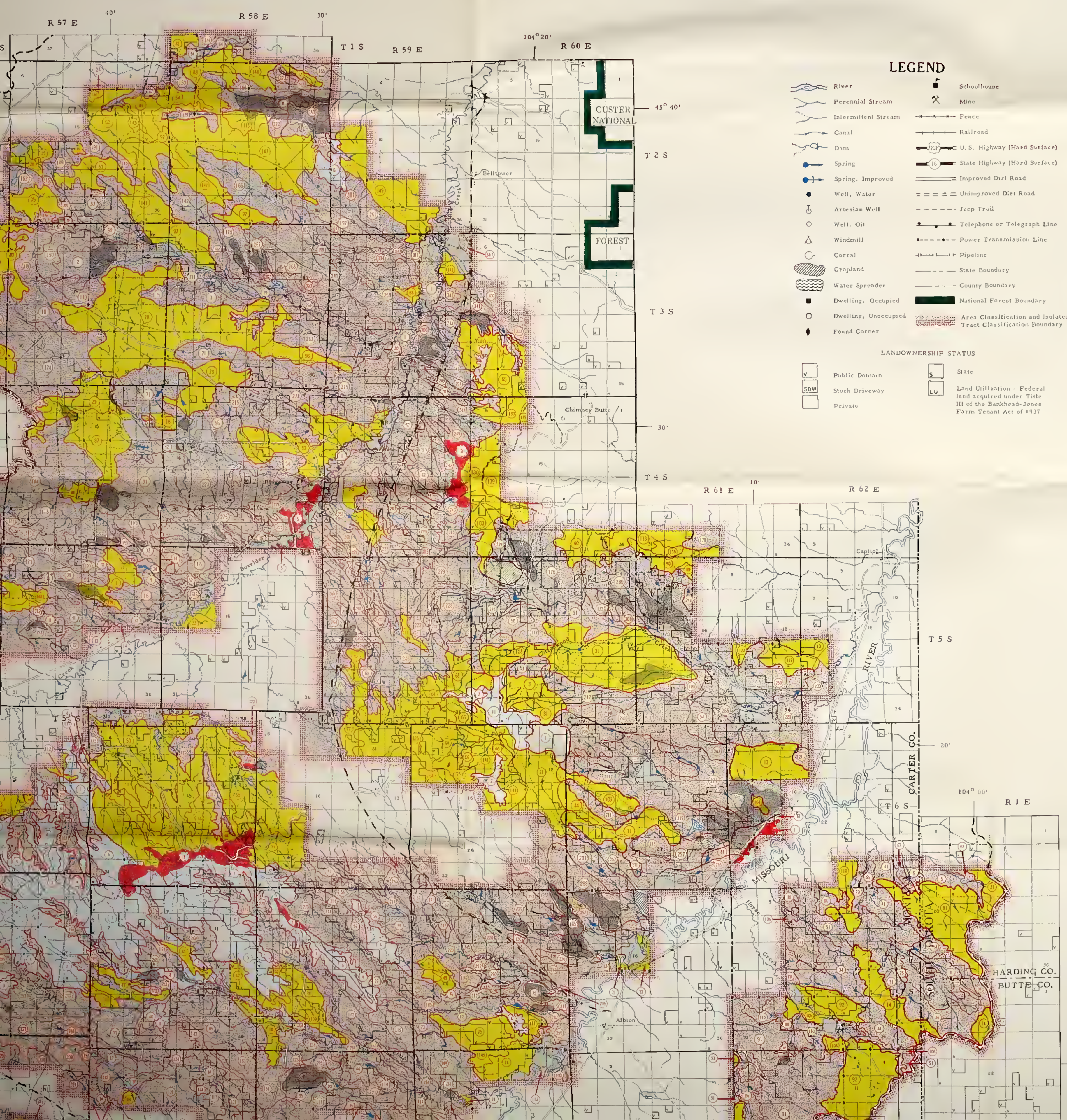
UNITED STATES
DEPARTMENT OF THE INTERIOR

BUREAU OF LAND MANAGEMENT
AREA 3

MISSOURI RIVER BASIN

NORTH DAKOTA, SOUTH DAKOTA & WYOMING

0 1 2 3 4 5 6
Scale in Miles



LEGEND

River — Schoolhouse
Perennial Stream — Mine
Intermittent Stream — Fence
Canal — Railroad
Dam — U.S. Highway (Hard Surface)
Spring — State Highway (Hard Surface)
Spring, Improved — Improved Dirt Road
Well, Water — Unimproved Dirt Road
Artesian Well — Jeep Trail
Well, Oil — Telephone or Telegraph Line
Windmill — Power Transmission Line
Corral — Pipeline
Cropland — State Boundary
Water Spreader — County Boundary
Dwelling, Occupied — National Forest Boundary
Dwelling, Unoccupied — Area Classification and Isolated Tract Classification Boundary
Found Corner

LANDOWNERSHIP STATUS

V Public Domain — S State
SDW Stock Driveway — LU Land Utilization - Federal land acquired under Title III of the Bankhead-Jones Farm Tenant Act of 1937
Private

LAND CLASSIFICATION MAP

SHOWING

VEGETATION, RANGE CONDITION, RECOMMENDED STOCKING RATE

RANGE SITE AND LAND USE CAPABILITY

CLASSIFICATION FORMULAS

1 GRASS

(1) 1 Ada Psc PUC F.10 / SU VI B 3-1-2 3F2K
(2) 1 Ada Aga Forbs E.19 / SU VI B 2-1-2 3F2K
(3) 1 Asc Bgr Psc E.16 / VS VII E 2-1-1 5F3F
(4) 1 Asm .10 / Cl IV A 2-1-1 1H2T
(5) 1 Asm Ada Bgr F.20 / Cl IV C 2-1-1 3H2K
(6) 1 Asm Ada Psc G.15 / SU VI B 2-1-2 3H2K
(7) 1 Asm Alf E 4.0 / Ld VI A 1-1-1 1M1T
(8) 1 Asm Asc Clo G.09 / Sh VII C 3-1-3 5H2K
(9) 1 Asm Asc Svi G.09 / Sh VII D 3-1-2 5V1K
(10) 1 Asm Atr Bgr G.21 / Sw VI B 2-1-1 4H2K
(11) 1 Asm Atr Bda G.29 / Cl VI C 2-1-1 3M4K
(12) 1 Asm Atr G.28 / Ld IV A 1-1-1 1H2K
(13) 1 Asm Atr Gsa E.14 / Sh VII C 2-1-2 5V1K
(14) 1 Asm Atr Mcu E.14 / Sh VII C 2-1-2 5V1K
(15) 1 Asm Atr PHL E.11 / Sh VII C 3-1-2 5V1K
(16) 1 Asm Atr Psc F.21 / Ld IV A 1-1-1 1H3K
(17) 1 Asm Atr Wds F.15 / CS VI B 3-1-2 3H2K
(18) 1 Asm Atr Wds G.17 / CS VI B 3-1-1 1H2T
(19) 1 Asm Bda Atr G.29 / Cl VI B 2-1-1 3M4K
(20) 1 Asm Bda Bgr G.28 / OU IV A 1-1-1 3F3K
(21) 1 Asm Bda Bgr C.21 / Cl IV C 2-1-1 3F2Y
(22) 1 Asm Bda Cfi G.20 / Sw V C 2-1-1 4S1K
(23) 1 Asm Bda Kcr C.26 / OU VI C 2-1-1 3S1K
(24) 1 Asm Bda Kcr G.18 / Sc VI B 2-1-1 4M2K
(25) 1 Asm Bda Sco G.30 / Cl VI B 2-1-1 3F3K
(26) 1 Asm Bda Sco G.30 / OU VI C 2-1-1 3M3S
(27) 1 Asm Bda Sco G.22 / OU VI C 2-1-2 3M4F
(28) 1 Asm Bda Svl G.22 / Cl IV B 2-1-1 2H3K
(29) 1 Asm Bda Svl G.24 / OU IV C 2-1-1 3M4K
(30) 1 Asm Bda Svi G.24 / Cl IV B 2-1-1 2H3K
(31) 1 Asm Bgr Atr G.19 / Sw VI C 2-1-1 4F3N
(32) 1 Asm Bgr Bda G.21 / Sw VI B 2-1-1 4M3K
(33) 1 Asm Bgr Bda C.25 / OU VI C 2-1-1 3F2K
(34) 1 Asm Bgr Bto G.30 / Cl VI C 2-1-1 2H2K
(35) 1 Asm Bgr Cfi F.20 / OU VI C 1-1-1 3M4F
(36) 1 Asm Bgr Kcr G.21 / Cl VI B 2-1-1 3H2K
(37) 1 Asm Bgr Sco F.22 / Sw VI G 2-1-1 4H2F
(38) 1 Asm Bgr Sco G.2 / Sw VI B 2-1-3 4M3K
(39) 1 Asm Cel Clo G.19 / CS VI C 2-1-2 3H2K
(40) 1 Asm Cfi Sco E.11 / Sh VII D 3-1-2 5V1K
(41) 1 Asm Clo Kcr G.15 / VS VII C 2-1-2 5H2K
(42) 1 Asm Clo PHL G.10 / Sh VII C 2-1-2 5V1K
(43) 1 Asm Cvi Mcu G.20 / CS VI C 2-1-1 3H2K
(44) 1 Asm Dst Bgr C.09 / Sh VII D 2-1-2 5V1K
(45) 1 Asm Ela PHL G.25 / Cl VI C 2-1-1 3H3K
(46) 1 Asm Gsa Pca F.15 / Sw VI C 3-1-2 4H2K
(47) 1 Asm Gsa Svl F.20 / Cl VI B 2-1-1 3H2K
(48) 1 Asm Hju Atr F.21 / Ld IV B 2-1-1 1V2K
(49) 1 Asm Kcr Atr G.22 / Cl VI C 2-1-1 3H2K
(50) 1 Asm Kcr Bda G.26 / Cl VI C 2-1-1 3H2K
(51) 1 Asm Kcr Bgr F.20 / Cl VI B 2-1-1 3H2K
(52) 1 Asm Kcr Bgr G.3 / OU VI C 2-1-2 3F3K
(53) 1 Asm Kcr Bgr F.10 / SU VII B 2-1-2 2H2K
(54) 1 Asm Kcr CHE F.07 / Sh VII C 3-1-2 5H2K
(55) 1 Asm Kcr Gsa G.22 / Cl VI C 2-1-1 3H2K
(56) 1 Asm Kcr Sco G.20 / Sw VI B 2-1-1 4F3K
(57) 1 Asm Kcr Sco G.2 / Sw VI B 2-1-1 4F3K
(58) 1 Asm Kcr Sco G.30 / Cl VI A 1-1-1 3H2K
(59) 1 Asm Kcr Psc G.16 / CS VI C 2-1-1 3H3K
(80) 1 Asm Sil PUC G.15 / SU VI B 2-1-2 3F2K
(81) 1 Asm Sco Psc E.17 / VS VII D 2-1-2 5M2K
(82) 1 Asm Sco Kcr G.30 / OU IV B 2-1-1 3M4F
(83) 1 Asm Sco Bda G.24 / Cl VI B 2-1-1 3H2K
(84) 1 Asm Sco Bgr G.22 / OU VI C 2-1-1 3F3S
(85) 1 Asm Svl Bda E.32 / Sy V B 1-1-1 4S3F
(86) 1 Asm Svi Bda G.30 / OU VI C 2-1-1 3F3K
(87) 1 Asm Svi Bda E.26 / CS IV C 2-1-1 3H2K
(88) 1 Asm Svl Cfi G.24 / Cl VI B 2-1-1 3H3K
(89) 1 Asm Svl Kcr G.10 / Sh VII D 3-1-2 5V1K
(90) 1 Asm Svi Pca E.23 / CS VI B 3-1-1 3H2K
(91) 1 Asm Svl Mcu E.15 / Sh VII C 2-1-2 5V1K
(92) 1 Asm Svl Mcu G.18 / CS VI C 2-1-1 3H2K
(93) 1 Asm Svi Mcu G.18 / CS VI C 1-1-1 3H3K
(94) 1 Asm Svi Psc E.16 / TB VII D 2-1-2 2H2K
(95) 1 Asm Svl Psc E.18 / TB VII C 3-1-3 5H2K
(96) 1 Asm Svl Wds G.09 / Sh VII C 2-1-2 5V1K
(97) 1 Asm Svl Wds E.21 / CS VI C 2-1-2 3H2K
(98) 1 Asm Svl Wds G.28 / Cl VI C 2-1-1 3H2K
(99) 1 Asm Svl Wds E.33 / Cl IV B 1-1-1 1H2T
(100) 1 Asm Wds F.20 / Cl IV A 3-1-1 1H2T
(101) 1 Asm Wds G.33 / Cl IV A 2-1-1 1H2T
(102) 1 Asm Wds G.16 / Sw VI C 3-1-2 4H2K
(103) 1 Asm Wds G.07 / Sh VII C 3-1-2 5V1K
(104) 1 Atr Asm Psc F.20 / Cl VI C 2-1-1 3H3Y
(105) 1 Bda Asm Bgr F.18 / Cl IV B 2-1-1 3H2K
(106) 1 Bda Asm Bgr F.18 / Cl IV C 2-1-1 3H2K
(107) 1 Bda Asm Cfi G.22 / OU VI C 2-1-1 3F3K
(108) 1 Bda Bgr Asm C.20 / Sw VI C 2-1-1 4M4F
(109) 1 Bda Ugr Atr F.14 / Sw VII C 2-1-1 4H3K
(110) 1 Bda Bgr OPU G.16 / CS VI B 3-1-1 3M2K
(111) 1 Bgr Asm Bda F.20 / OU VI C 2-1-1 3M4X
(112) 1 Bgr Asm Bda C.28 / OU VI C 1-1-1 3M4F
(113) 1 Bgr Asm Cfi G.28 / OU VI C 1-1-1 3M4F
(114) 1 Bgr Asm Sco G.20 / Sw VII C 2-1-1 4H2K
(115) 1 Bgr Asm OPU F.13 / CS VI B 3-1-1 3S2F
(116) 1 Bgr Bda Kcr G.14 / VS VII B 2-1-1 5F3K
(117) 1 Bgr Cll Asm G.20 / Sw VI D 1-2-1 4L5K
(118) 1 Bgr Cll Asm F.20 / Sy VI C 2-1-1 3L5F
(119) 1 Bgr Cfi Sco F.18 / Sy IV B 1-1-1 3S5K
(120) 1 Bgr Kcr Psc F.15 / Sw VI B 2-3-1 4M1K
(121) 1 Bgr Sco Asc F.20 / OU VI C 2-1-1 3F3K
(122) 1 Bgr Sco Clo G.28 / Sy VII B 1-3-1 3S5K
(123) 1 Bgr Svl Kcr G.21 / Sw VI C 2-1-1 4S5F
(124) 1 Bgr Svl Sco F.28 / Sy VII B 1-3-1 3S5K
(125) 1 Cfl Asm Kcr E.16 / TB VII E 2-1-2 5M4F
(126) 1 Cfi Bgr Asm G.16 / Sw VI C 1-1-1 4S5K
(127) 1 Cfi Bgr Asm G.16 / Sw VI C 2-1-1 4S5F
(128) 1 Cfi Bgr Asm C.22 / Sy VI C 2-1-1 3L5F
(129) 1 Cfi Bgr Sco G.26 / Sy IV B 1-1-1 3L5F
(130) 1 Cfi Kcr Sco G.22 / Sy VII D 2-1-2 4S4F
(131) 1 Cfi Sco Asm. C.20 / Sw VII D 2-1-1 5F3F
(132) 1 Cfi Sco Kcr G.18 / Sw VI C 2-1-1 4M4F
(133) 1 Cfi Sco Kcr G.19 / Sw VII C 2-1-1 4L5F
(134) 1 Cll Sco Asm G.28 / Sy VII C 2-1-1 1S5F
(135) 1 Clo Asm Asc G.08 / Sh VII C 3-1-2 5V1K
(136) 1 Cfi Svl Asm G.10 / Sh VII C 3-1-2 5V1K
(137) 1 Dst Asm PUC F.24 / SL IV B 2-1-1 1H2Y
(138) 1 Dst PUC Atr F.11 / SL VI A 2-1-1 1H2K
(139) 1 Kcr CAR Clo E.33 / Sy IV B 1-1-1 2S5F
(140) 1 Kcr Svi Asm E.24 / Sw VI C 2-1-1 4F3K

(6) 4 Ada Asm Atr G.17 / Sc VI A 3-1-1 2H2T
(7) 4 Ada Asm Atr G.18 / CS VI C 2-1-1 3F3K
(8) 4 Ada Asm Atr G.18 / Ld VI A 2-1-2 1H2K
(9) 4 Ada Asm OPU F.10 / Sc VI B 3-1-1 4H2K
(10) 4 Ada Asm Psc F.15 / Sc VI B 3-1-2 4F3K
(11) 4 Ada Asm Svi G.20 / CS VI C 2-1-2 3H2K
(12) 4 Ada Bda Bgr G.22 / Cl IV B 2-1-1 3H2K
(13) 4 Ada Bgr Kcr E.16 / VS VII B 3-1-1 5H2K
(14) 4 Ada Kcr Atr F.13 / Sc VI B 3-1-1 4H2K
(15) 4 Ada Kcr Bda F.15 / Sc VI B 3-1-2 4H2K
(16) 4 Ada Psc Atr F.12 / Sc VI B 3-1-2 4H2K
(17) 4 Ada Psc Atr F.13 / Sc VI A 3-1-2 1H2K
(18) 4 Ada Psc Atr F.15 / CS VI C 3-1-2 3H2K
(19) 4 Ada Psc Kcr F.12 / Sc VI B 3-1-2 3H2K
(20) 4 Ada Psc OPU F.10 / Sc VI B 3-1-1 4H2K
(21) 4 Ada Svi Atr F.15 / CS VI B 3-1-1 3H2K
(22) 4 Ada Svi Bda G.18 / CS VI C 2-1-2 3H2K
(23) 4 Ada Svi Kcr G.19 / CS VI C 3-1-2 3H2K
(24) 4 Asa Kcr Atr G.15 / SU VI B 2-1-2 2V1K
(25) 4 Asc Clo Asm G.03 / Sh VII D 3-1-2 5V1K
(26) 4 Asm Ada Atr F.15 / CS VI C 3-1-1 3F2K
(27) 4 Asm Ada Atr G.17 / CS VI C 2-1-1 2H2K
(28) 4 Asm Ada Atr G.24 / Cl VI B 2-1-2 2H3K
(29) 4 Asm Ada Atr G.24 / Cl IV A 2-1-2 2H3K
(30) 4 Asm Ada Bda F.16 / Sw VI C 2-1-2 4S1K
(31) 4 Asm Ada Bda G.20 / CS VI C 2-1-1 3H2K
(32) 4 Asm Ada OPU F.06 / Sc VI B 3-1-2 4H2K
(33) 4 Asm Ada OPU F.08 / Sc VI B 3-1-2 4H2T
(34) 4 Asm Ada OPU G.17 / CS VI C 2-1-1 3H2K
(35) Asm Ada OPU G.17 / CS VI C 2-1-2 5V1K
(36) 4 Asm Ada OPU G.17 / CS VI C 2-1-2 3H3K
(37) 4 Asm Ada Psc G.16 / CS VI C 3-1-1 3H2K
(38) 4 Asm Ada Psc G.18 / Cl V B 2-1-2 3H2K
(39) 4 Asm Ada Svi G.24 / CS VI C 2-1-1 3H2K
(40) 4 Asm Asc Atr E.17 / TB VII D 2-1-2 5H2K
(41) 4 Asm Atr Aga F.15 / Sc VI A 3-1-2 2H2T
(42) 4 Asm Atr Asc F.07 / Sh VII C 3-1-3 5V1K
(43) 4 Asm Atr Bda F.14 / OU VI B 2-1-1 3F3K
(44) 4 Asm Atr Bda G.19 / Sc VI B 2-1-2 3F2K
(45) 4 Asm Atr Bda G.22 / Cl IV B 2-1-3 3H2T
(46) 4 Asm Atr Bda G.26 / Cl VI C 2-1-1 3H2K
(47) 4 Asm Atr Bgr G.13 / VS VII B 2-3-1 5H2K
(48) 4 Asm Atr Bgr C.15 / Cl VI C 2-1-2 3H2K
(49) 4 Asm Atr Bgr C.20 / CS VI C 2-1-1 1H2K
(50) 4 Asm Atr Bgr G.19 / CS VI B 2-1-1 3H2K
(51) 4 Asm Atr Bgr G.18 / Sc VI B 2-1-2 4H2K
(52) 4 Asm Atr Bgr G.28 / Sy VII D 2-1-1 3M4K
(53) 4 Asm Atr ERI F.07 / Sh VII D 4-1-3 5V1K
(54) 4 Asm Atr Gsa F.12 / Sw VI B 2-1-1 4H2S
(55) 4 Asm Atr Hju P.05 / Cl VI B 3-3-3 2V2Y
(56) 4 Asm Atr Kcr G.17 / CS VI C 2-1-1 3H2K
(57) 4 Asm Atr Kcr C.22 / Cl VI C 2-1-1 2H2K
(58) 4 Asm Atr Kcr G.22 / Cl IV B 2-1-1 3H2K
(59) 4 Asm Atr Kcr G.22 / Cl VI C 2-1-2 3H2K
(60) 4 Asm Atr Kcr G.26 / Cl IV B 2-1-1 1H2K
(61) 4 Asm Atr OPU F.12 / Sc VI B 3-1-1 3F3K
(62) 4 Asm Atr OPU F.12 / Sc VI B 3-1-1 3F2K
(63) 4 Asm Atr OPU F.14 / Sc IV B 3-1-2 4S1T
(64) 4 Asm Atr OPU F.15 / Sc VI B 3-1-2 4H3K
(65) 4 Asm Atr OPU G.17 / Sc IV A 3-1-1 1H2T
(66) 4 Asm Atr OPU G.21 / Cl IV A 2-1-1 2V2T
(87) 4 Asm Bda Atr F.15 / Sw VI C 3-1-2 4F3K
(88) 4 Asm Bda Atr C.16 / Sc VI B 3-1-2 2H2K
(89) 4 Asm Bda Atr F.16 / Cl IV B 2-1-2 3H2K
(90) 4 Asm Bda Atr C.16 / Sc VI B 3-1-2 4S4T
(91) 4 Asm Bda Atr G.18 / CS VI C 2-1-2 3H2K
(92) 4 Asm Bda Atr G.18 / Sc VI B 2-1-2 2H3K
(93) 4 Asm Bda Atr G.18 / Sc VI B 3-1-2 2H3K
(94) 4 Asm Bda Atr G.18 / Sc VI B 2-1-2 4H3K
(95) 4 Asm Bda Atr G.24 / Cl IV B 2-1-2 3M3T
(96) 4 Asm Bda Atr E.24 / Sc VI B 3-1-2 2H3K
(97) 4 Asm Bda Atr E.24 / Sc VI B 3-1-2 3H3K
(98) 4 Asm Bda Atr G.28 / Cl VI B 2-1-1 3H2K
(99) 4 Asm Bda Atr G.28 / Sy VII C 2-1-1 3S5F
(100) 4 Asm Bda Bgr G.16 / Sc IV B 3-1-1 1H2T
(101) 4 Asm Bda Bgr F.20 / OU VI B 2-1-2 3F2K
(102) 4 Asm Bda Bgr F.20 / OU VI B 3-1-1 3F3S
(103) 4 Asm Bda Bgr F.20 / OU VI B 2-1-1 3M4K
(104) 4 Asm Bda Kcr G.10 / CS VI C 2-1-2 2H3K
(105) 4 Asm Bda Kcr G.14 / CS VI C 2-1-2 2H1K
(106) 4 Asm Bda Kcr G.16 / Sw VI B 2-1-2 4F3K
(107) 4 Asm Bda Kcr C.16 / Sw VI B 2-1-2 4H3K
(108) 4 Asm Bda Kcr G.19 / CS VI C 2-1-2 2H3K
(109) 4 Asm Bda Kcr E.24 / Sc VI B 3-1-2 2H2K
(110) 4 Asm Bda OPU G.17 / Sw VI C 3-1-2 4H2K
(111) 4 Asm Bda OPU C.17 / Sw VI C 3-1-2 4H2K
(112) 4 Asm Bda Psc G.24 / OU VI C 2-1-1 3F4K
(113) 4 Asm Bda Sco G.22 / OU IV B 2-1-1 3M4T
(114) 4 Asm Bda Svl G.17 / CS VI C 2-1-2 3H2K
(115) 4 Asm Bda Svi G.20 / Cl IV B 3-1-1 3H2K
(116) 4 Asm Bda Svi G.24 / OU IV C 2-1-1 2F4K
(117) 4 Asm Bda Svl G.26 / OU VI B 2-1-1 1F3K
(118) 4 Asm Bgr Atr C.08 / Sh VII C 3-1-3 4V2K
(119) 4 Asm Bgr Atr F.10 / VS VII B 3-1-1 5H2K
(120) 4 Asm Bgr Atr G.10 / Sh VII C 3-1-3 4V2K
(121) 4 Asm Ugr Atr G.20 / Sw VI B 2-1-1 4M4K
(122) 4 Asm Bgr Atr G.30 / OU VI B 1-1-1 3M4K
(123) 4 Asm Bgr Atr G.30 / OU VI G 1-1-1 3M4K
(124) 4 Asm Bgr Bda G.25 / OU VI C 2-1-1 3F2K
(125) 4 Asm Bgr Gsa C.17 / Sc VII B 2-1-1 5H2K
(126) 4 Asm Bgr Kcr G.10 / Sh VII B 3-1-2 4H2K
(127) 4 Asm Bgr Kcr F.10 / VS VII D 3-1-2 5M4F
(128) 4 Asm Bgr Kcr F.15 / Sw VII C 2-1-2 3M4F
(129) 4 Asm Bgr Kcr G.20 / Cl VI B 2-1-2 3H2K
(130) 4 Asm Bgr Sco G.20 / Sw VI B 2-1-1 4H2K
(131) 4 Asm Cel Clo G.19 / CS VI C 2-1-2 3H2K
(132) 4 Asm Cfi Sco E.25 / Sw VI B 2-1-1 4H2K
(133) 4 Asm ERI Atr F.10 / VS VII C 3-1-3 5H3K
(134) 4 Asm ERI Atr P.10 / VS VII G 3-1-3 5H2K
(135) 4 Asm Gsa Atr G.18 / Sw VI B 2-1-2 4H2K
(136) 4 Asm Kcr Aca G.26 / Cl VI C 2-1-2 2H2K
(137) 4 Asm Kcr Aga G.26 / Cl VI C 2-1-2 2H2K
(138) 4 Asm Kcr Atr F.10 / SU VII C 3-1-2 2H2K
(139) 4 Asm Kcr Atr F.14 / Sc VI B 3-1-3 3F2K
(140) 4 Asm Kcr Atr F.14 / Sc VI B 3-1-2 2H2K
(141) 4 Asm Kcr Atr F.15 / Sw VI B 2-1-1 4H2K
(142) 4 Asm Kcr Atr F.15 / Sc VI B 3-1-3 3H3K
(143) 4 Asm Kcr Atr F.15 / Sw VI B 2-1-1 1H2K
(144) 4 Asm Kcr Atr F.15 / Sw VI C 2-1-2 4H2K
(145) 4 Asm Kcr Atr F.20 / Cl VI B 2-1-1 3H2K
(146) 4 Asm Kcr Atr G.15 / SU V3 B 2-1-2 2V1K
(147) 4 Asm Kcr Atr G.15 / SU VI B 2-1-1 4V1K
(168) 4 Asm OPU Atr C.17 / Sc VI C 2-1-2 3H2K
(169) 4 Asm Pca Atr G.30 / Cl IV A 3-1-1 1H2T
(170) 4 Asm Psc Atr F.14 / CS VI B 2-1-2 2H3K
(171) 4 Asm Psc Atr F.14 / Cl VI B 3-1-2 2H3K
(172) 4 Asm Psc Atr F.22 / Ld TV B 2-1-1 1V2K
(173) 4 Asm Psc Atr G.10 / Sh VII B 3-1-2 1V2K
(174) 4 Asm Psc Atr G.17 / CS VI B 2-1-1 3H2K
(175) 4 Asm Psc Atr G.24 / Cl VI C 2-1-1 2H2K
(176) 4 Asm Psc Bgr C.21 / Sc VI B 3-1-2 3H2K
(177) 4 Asm Psc Forbs E.16 / TB VII D 3-1-2 4M4F
(178) 4 Asm Sco Kcr E.32 / Cl VI A 2-1-1 3H2K
(179) 4 Asm Sco Kcr G.28 / OU IV B 2-1-1 3M4F
(180) 4 Asm Svl Atr G.18 / CS VI C 2-1-1 3H2K
(181) 4 Asm Svi Atr G.18 / CS VI C 2-1-2 3H2K
(182) 4 Asm Svi Atr G.20 / CS VI C 2-1-1 1H2K
(183) 4 Asm Svi Atr G.20 / CS VI C 2-1-1 3F3K
(184) 4 Asm Svi Atr G.20 / CS VI C 2-1-1 3H2K
(185) 4 Asm Svi Atr G.22 / CS VI C 2-1-2 3H2K
(186) 4 Asm Svl Atr G.28 / Cl IV B 2-1-3 2H2K
(187) 4 Asm Svl Atr G.30 / CS VII C 3-1-2 4H2K
(188) 4 Asm Svl Atr G.30 / CS VII B 3-1-2 4H2K
(189) 4 Asm Svl Bda G.20 / CS VI C 2-1-1 3H3K
(190) 4 Asm Svi Bda G.20 / CS VI C 2-1-1 3F3K
(191) 4 Asm Svi Bda G.28 / Cl VI B 3-1-2 2H2K
(192) 4 Asm Svi Bgr G.20 / Sw VI B 2-1-1 4H2K
(193) 4 Asm Svl Kcr G.20 / Sw VII D 2-1-1 4M4F
(194) 4 Asm Svi Kcr G.22 / Sw VI B 2-1-2 4H3Y
(195) 4 Asm Svi Kcr E.25 / Sw VI B 2-1-1 4H2K
(196) 4 Asm Svi Pca G.18 / CS VI C 2-1-1 3H2K
(197) 4 Atr Aga Asm F.13 / CS VII C 3-1-2 2H2T
(198) 4 Atr Aga OPU F.06 / SL VII B 3-1-2 3H2K
(199) 4 Atr Asc Pca F.11 / Sc VI B 3-1-2 1H2T
(200) 4 Atr Asm Aca F.14 / Sc VI B 2-1-1 4H2K
(201) 4 Atr Asm Ada F.15 / Sc VI C 3-1-3 3H2K
(202) 4 Atr Asm Ada F.17 / Sc VI A 2-1-1 4H2K
(203) 4 Atr Asm Asp F.16 / Cl VI C 2-1-1 3H2K
(204) 4 Atr Asm G.20 / Cl VI C 2-1-2 2H2K
(205) 4 Atr Asm Bda F.14 / OU VI B 2-1-1 3F3K
(206) 4 Atr Asm Bda F.14 / Sc VII C 2-1-1 5H2K
(207) 4 Atr Asm Bda F.14 / Sc VI A 2-1-1 4H2Y
(208) 4 Atr Asm Bda F.14 / Sc VI B 3-1-1 1H2K
(209) 4 Atr Asm Bda F.14 / Sc VI B 3-1-3 1H2K
(210) 4 Atr Asm Bda G.16 / CS IV A 3-1-1 3H2T
(211) 4 Atr Asm Bda G.16 / Sc VII B 2-1-1 2H2K
(212) 4 Atr Asm Bda G.16 / Sc IV A 2-1-1 3H2T
(213) 4 Atr Asm Bda G.18 / Cl VI B 2-1-2 3H2K
(214) 4 Atr Asm Bda F.18 / Cl VI C 2-1-2 3H2K
(215) 4 Atr Asm Bda C.18 / CS VI C 2-1-1 3H2K
(216) 4 Atr Asm Bda G.18 / Sw VI B 2-1-1 4H2Y
(217) 4 Atr Asm Bda G.22 / Cl IV B 2-1-1 1H2K
(218) 4 Atr Asm Bda F.2 / Cl VI C 2-1-1 2H3K
(219) 4 Atr Asm Bda G.20 / Sc VII C 2-1-2 2H2K
(220) 4 Atr Asm Bda C.22 / Cl VI B 2-1-1 3H2K
(221) 4 Atr Asm Bda G.22 / Cl VI C 2-1-1 3H2K
(222) 4 Atr Asm Bda G.22 / OU VI C 2-1-1 3M4T
(223) 4 Atr Asm Bda G.25 / OU VI B 2-1-1 3F3K
(224) 4 Atr Asm Bgr G.15 / Sc VI B 3-1-2 3H2K
(225) 4 Atr Asm Bgr G.16 / CS VI C 2-1-2 3H2K
(226) 4 Atr Asm Bgr F.16 / Cl VI C 3-1-3 3H2K
(227) 4 Atr Asm Bgr G.18 / Sc VI B 2-1-1 4M2T
(228) 4 Atr Asm Bgr G.22 / Cl VI C 2-1-1 3H2K
(249) 4 Atr Asm Kcr G.17 / CS VI B 3-1-1 3H2T
(250) 4 Atr Asm Kcr G.17 / Sc VII B 2-1-1 4V1K
(251) 4 Atr Asm Kcr G.18 / Sc VI B 3-1-1 3H2K
(252) 4 Atr Asm Kcr G.24 / Cl VI B 2-1-3 1H2K
(253) 4 Atr Asm Kcr G.26 / Cl V B 2-1-2 1H2K
(254) 4 Atr Asm Mcu G.18 / CS VII C 3-1-2 4H2K
(255) 4 Atr Asm OPU F.08 / Sc VI A 4-1-1 1H2T
(256) 4 Atr Asm OPU F.10 / Sc IV B 3-1-3 1H2T
(257) 4 Atr Asm OPU F.10 / Sc VI A 2-1-1 4H2Y
(258) 4 Atr Asm OPU F.10 / Sc VI A 3-1-1 1H2T
(259) 4 Atr Asm OPU F.10 / Sc IV B 3-1-3 1H2T
(260) 4 Atr Asm OPU F.11 / Sc IV A 2-1-1 3H2T
(261) 4 Atr Asm OPU F.12 / CS VI B 3-1-2 3H2T
(262) 4 Atr Asm OPU F.13 / Sc IV A 3-1-2 1H2T
(263) 4 Atr Asm OPU F.13 / Sc VI B 3-1-2 3H2T
(264) 4 Atr Asm OPU F.13 / Sc IV B 3-1-2 1H2T
(265) 4 Atr Asm OPU F.14 / Sc VI B 3-1-2 1H2T
(266) 4 Atr Asm OPU G.15 / Sc VI B 2-1-2 1H2T
(267) 4 Atr Asm OPU G.16 / Sc VI B 3-1-2 1H2T
(268) 4 Atr Asm OPU G.18 / CS VI B 3-1-1 1H2K
(269) 4 Atr Asm OPU G.24 / Cl VI C 2-1-2 2H2K
(270) 4 Atr Asm OPU P.05 / Sc VI A 3-1-1 4H2T
(271) 4 Atr Asm OPU P.08 / Sc VI A 2-1-1 4H2Y
(272) 4 Atr Asm Pca G.20 / Cl IV B 2-1-2 1H2K
(273) 4 Atr Asm PHL F.12 / CS VI C 2-1-2 3H2K
(274) 4 Atr Asm PHL F.14 / CS VI C 3-1-1 3H2K
(275) 4 Atr Asm PHL F.15 / Sc VI B 2-1-1 4H2K
(276) 4 Atr Asm PHL F.15 / CS VI C 3-1-1 3H2K
(277) 4 Atr Asm PHL F.18 / Cl VI B 2-1-1 3H3Y
(278) 4 Atr Asm PHL C.12 / CS VI C 2-1-2 4H2K
(279) 4 Atr Asm PHL G.17 / CS VI C 2-1-2 4H2K
(280) 4 Atr Asm Psc F.10 / Sc VI B 3-1-1 3H2K
(281) 4 Atr Asm Psc F.15 / Sc IV A 3-1-1 1H2T
(282) 4 Atr Asm Psc F.16 / Cl IV B 2-1-1 1H2K
(283) 4 Bda Ada Psc F.17 / Cl VI B 3-1-2 2H2K
(284) 4 Atr Asm Psc F.18 / Cl IV A 3-1-1 1H2T
(285) 4 Atr Asm Psc F.22 / Cl IV B 2-1-1 3H3Y
(286) 4 Atr Asm Psc F.22 / Cl IV C 2-1-1 3H2Y
(287) 4 Atr Asm Psc G.22 / Cl IV C 2-1-1 3H2Y
(288) 4 Atr Asm Psc G.23 / Sw VI A 2-1-1 4F3K
(289) 4 Atr Asm Svi F.15 / Cl VI A 3-1-1 1H2T
(290) 4 Atr Asm Svi G.15 / CS VI C 2-1-2 3H2K
(291) 4 Atr Asm Svi G.17 / CS VI C 2-1-2 4H2K
(292) 4 Atr Asm Svl G.22 / Cl VI B 3-1-1 3H2T
(293) 4 Atr Asm Svl G.24 / Cl VI C 2-1-1 3H2K
(294) 4 Atr Asm Svl P.10 / Cl VI B 2-1-1 3V1K
(295) 4 Atr Bda Asm F.20 / Cl IV B 2-1-1 1H2T
(296) 4 Atr Bgr Asm G.17 / Sc IV B 3-1-1 1H2K
(297) 4 Atr ERI Asm F.06 / Sh VII C 3-1-2 5V1K
(298) 4 Atr Kcr Gsa F.15 / CS VI C 2-1-2 3H2K
(299) 4 Atr Kcr Asm F.20 / Cl VI C 2-1-2 3H2K
(300) 4 Atr Kcr Asm G.26 / OU IV B 2-1-1 3M4F
(301) 4 Atr OPU Aga F.10 / Sc VII B 3-1-2 4H2K
(302) 4 Atr OPU Asm P.07 / Sc VI A 3-1-1 4H2K
(303) 4 Atr OPU Asm P.08 / Sc VI A 3-1-2 1H2T
(304) 4 Atr OPU Asm F.10 / Sc VII B 3-1-2 2H2T
(305) 4 Atr OPU Asm F.10 / Sc VII B 4-1-2 3H2K
(306) 4 Atr OPU Asm F.10 / Sc VII B 4-1-3 3H2K
(307) 4 Atr OPU Aga F.10 / SC VII B 3-1-2 3H2K
(308) 4 Atr OPU Asm P.12 / Cl VI B 3-1-1 3H2K
(309) 4 Atr OPU Asm F.13 / Sc VII B 2-1-1 5H2K
(330) 4 Bgr Asm Atr F.14 / Sc VI B 3-1-3 3H3K
(331) 4 Bgr Atr Asm F.20 / CS VI C 2-1-2 4H2K
(332) 4 Bgr Cfi Asc G.28 / Sy VII C 1-1-1 3S5K
(333) 4 Bgr Kcr Asm E.16 / VS VII B 3-1-1 5H2K
(334) 4 Bgr Psc Asm C.20 / Sw VI B 2-1-1 4H2K
(335) 4 Bgr Psc Asm G.20 / Sw VI B 2-1-1 4H2K
(336) 4 Bgr Svl Atr G.26 / OU IV B 2-1-1 3M4K
(337) 4 Bgr Svi Sco G.22 / Sw VI C 2-1-1 4F3K
(338) 4 ERI Asm P.00 / Sh VII D 3-1-3 5H2K
(339) 4 ERI Asm Atr G.08 / Sh VII C 3-1-2 4V1K
(340) 4 ERI Asm Atr G.10 / Sh VII C 3-1-3 4V1K
(341) 4 Kcr Atr Asm F.14 / Sc VI B 3-2-2 1H2T
(342) 4 Kcr Svl Atr C.24 / Cl IV B 2-1-1 1H2T
(343) 4 Psc Asm Atr P.09 / Ld VI A 2-1-3 3F2K
(344) 4 Dst ERI Psc P.06 / Sc VII B 2-1-2 4H2K
(345) 4 Dst ERI Psc P.06 / Sc VII B 2-1-2 5V1K
(346) 4 Sst Svi Atr G.07 / Sh VII C 3-1-2 5V1K
(347) 4 Sco Kcr Atr G.28 / OU IV B 1-1-1 2M4Y
(348) 4 Svl Asm Atr E.31 / OU VI B 2-1-1 3F3K
(349) 4 Svi Asm Bda C.28 / OU VI B 2-1-1 3F4K
(350) 4 Svi Bgr Ada G.22 / Sw VI C 2-1-1 4H2K
(351) 4 Svl Kcr Bgr E.24 / Sw VI B 2-1-1 4H2K
(352) 4 Svi Kcr Psc G.21 / Sw VI B 2-1-1 4H2K

5 MOUNTAIN SHRUB

(1) 5 Asm POA BROG.10 / Cl IV B 2-1-2 1H2T

6 CONIFER

(1) 6 Asm Kcr Ppo F.10 / VS VII D 2-1-2 4M4F
(2) 6 Asm Kcr Ppo F.10 / VS VII D 2-1-1 5M4F
(3) 6 Asm Ppo Atr G.07 / Sh VII C 3-1-3 4F1K
(4) 6 Asm Ppo Atr G.16 / Sw VI C 3-1-2 4H2K
(5) 6 Asm Svi Kcr C.20 / Sw VII D 2-1-1 3F2K
(6) 6 Asp Kcr Ppo G.03 / VS VI B 2-1-1 3S4K
(7) 6 Bgr Kcr Cfi F.10 / VS VII C 2-1-2 3S4K
(8) 6 Ppo Asm Asc G.12 / VS VII C 2-1-2 5H2K
(9) 6 Ppo Jsc Clo F.03 / Sh VII D 3-1-2 4H2K

7 WASTE

(1) 7 Asm Ppo Atr F.0 / Bl VIII D 4-1-4 5V1K
(2) 7 W / Bl VIII D 4-1-3 5V1K

8 BARREN

(1) 8 Barren / Bl VII D 3-1-2 5V1K
(2) 8 Barren / Bl VIII D 4-1-4 5V1K

9 JUNIPER

(1) 9 Jsc Asm Psc F.05 / Sh VII D 3-1-4 4H2K

13 SALTBUSH

(1) 13 Aga Asm Cna G.21 / Sc VII A 1-1-1 5V1K
(2) 13 Aga Asm Pca G.02 / Bl VII D 4-1-3 5V1K
(3) 13 Aga Asm Gsa C.10 / Sh VII D 3-1-2 4H3K
(4) 13 Aga Asm Gsa F.15 / Sw VII D 2-1-2 4H3K
(5) 13 Aga Pca Sci G.13 / SU VI B 3-1-2 3H2K
(6) 13 Aga Pca Sai G.13 / SU VI B 3-1-2 3H2T
(7) 13 Aga Asm Gsa E.13 / Sh VII C 3-1-2 5V3K
(8) 13 Asm Aga PHL G.15 / SU VI C 2-1-2 4H2K
(9) 13 Asm Aga Atr F.05 / Sh VII C 3-1-2 4H3K
(10) 13 Asm Kcr Aga C.10 / Sh VII C 3-1-2 4H3K

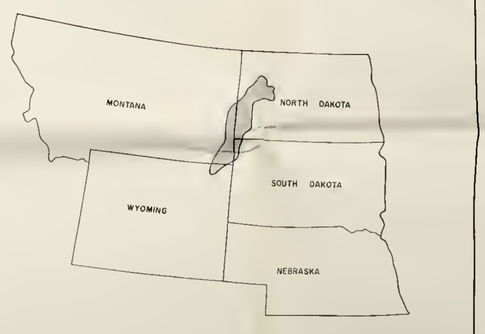
T 3 N
46° 00'
Montana Grazing District #3
FALLON CO.
BOWMAN CO.
LITTLE
46° 00'
T 129 N
R 61 E
R 62 E
104° 10'
NORTH DAKOTA
R 107 W
104° 00'
R 106 W
SOUTH DAKOTA

NORTH STUDY AREA

INSET MAP OF LITTLE MISSOURI RIVER BASIN
KEY TO STUDY AREAS

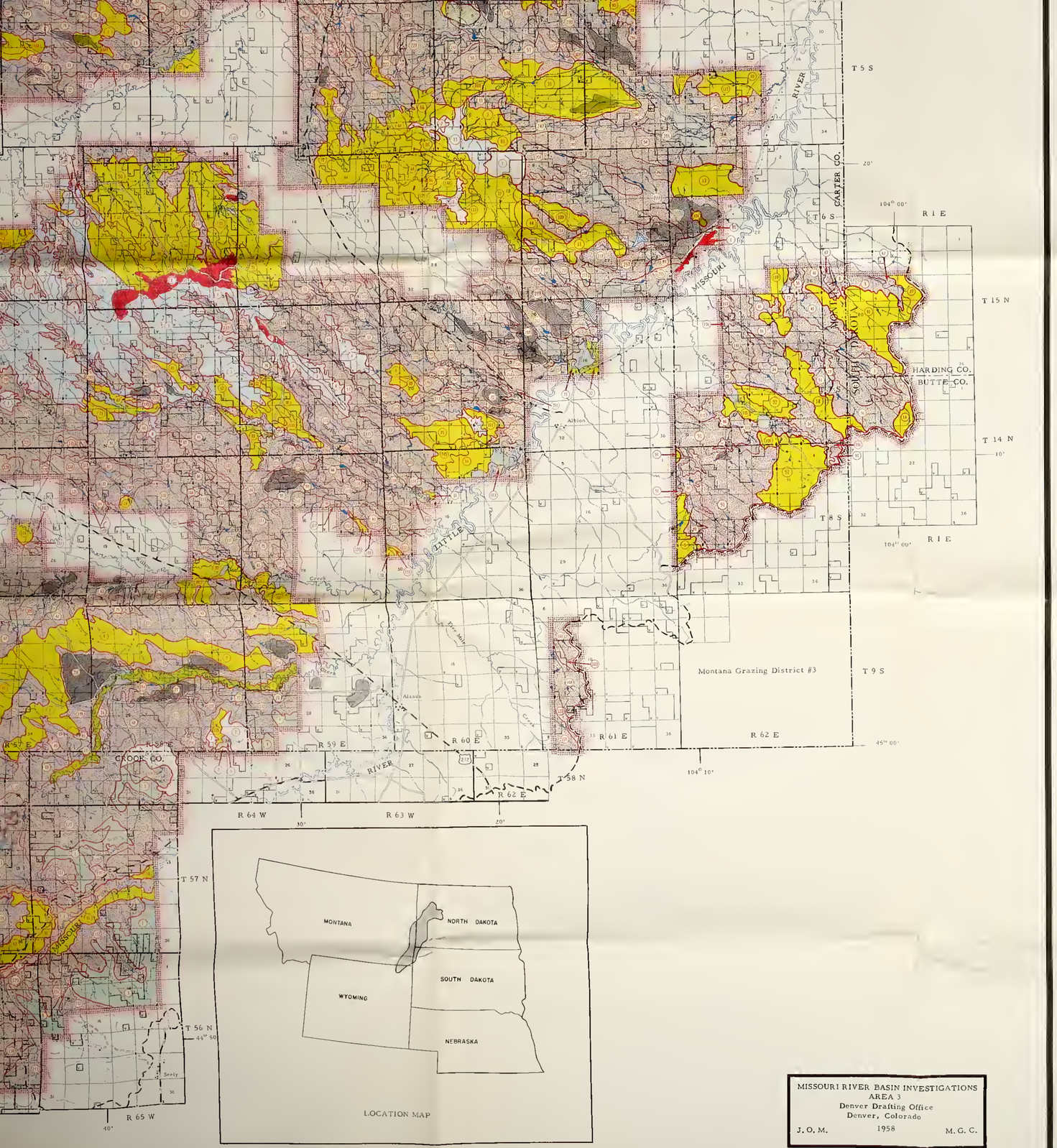
T 5 S
T 6 S
T 7 S
T 8 S
T 9 S
105° 00'
R 55 E
Ridge
CARTER CO.
R 56 E
MONTANA
WYOMING
R 57 E
R 58 E
CROOK CO.
R 59 E
R 60 E
R 61 E
R 62 E
104° 10'
Montana Grazing District #3
T 58 N
Lightning Flats
Blackbank Butte
T 57 N
CAMPBELL CO.
T 56½ N
T 56 N
44° 50'
CROOK CO.
R 69 W
R 68 W
105° 00'
R 67 W
50'
R 66 W
40'
R 65 W
R 64 W
30'
R 63 W
20'
Hammond
Albion
Alzada
Seely
MISSOURI
LITTLE MISSOURI RIVER
CARTER CO.

SOUTH STUDY AREA

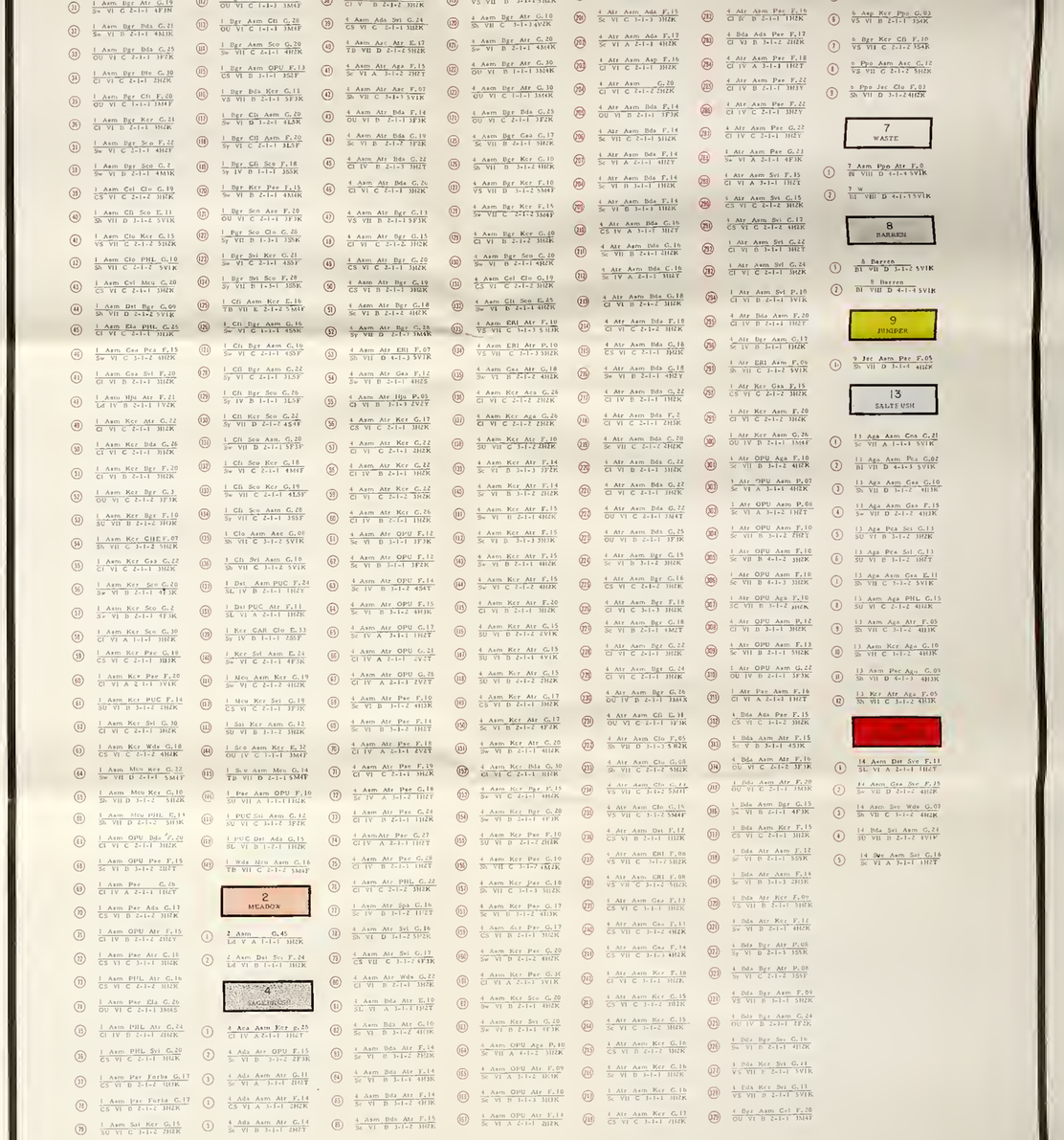


LOCATION MAP

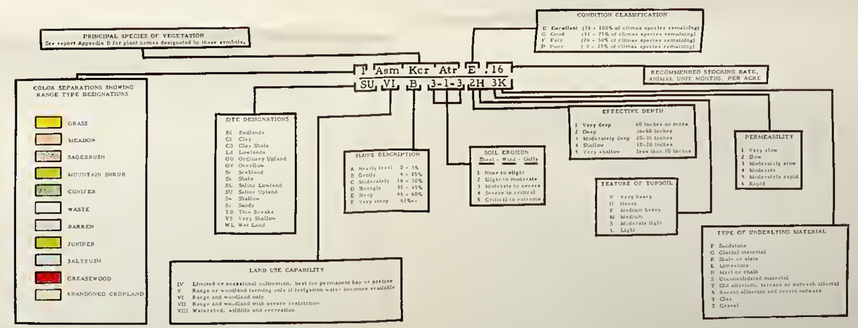
MISSOURI RIVER BASIN
AREA
Denver Draftin
Denver, Colo
J. O. M. 1958

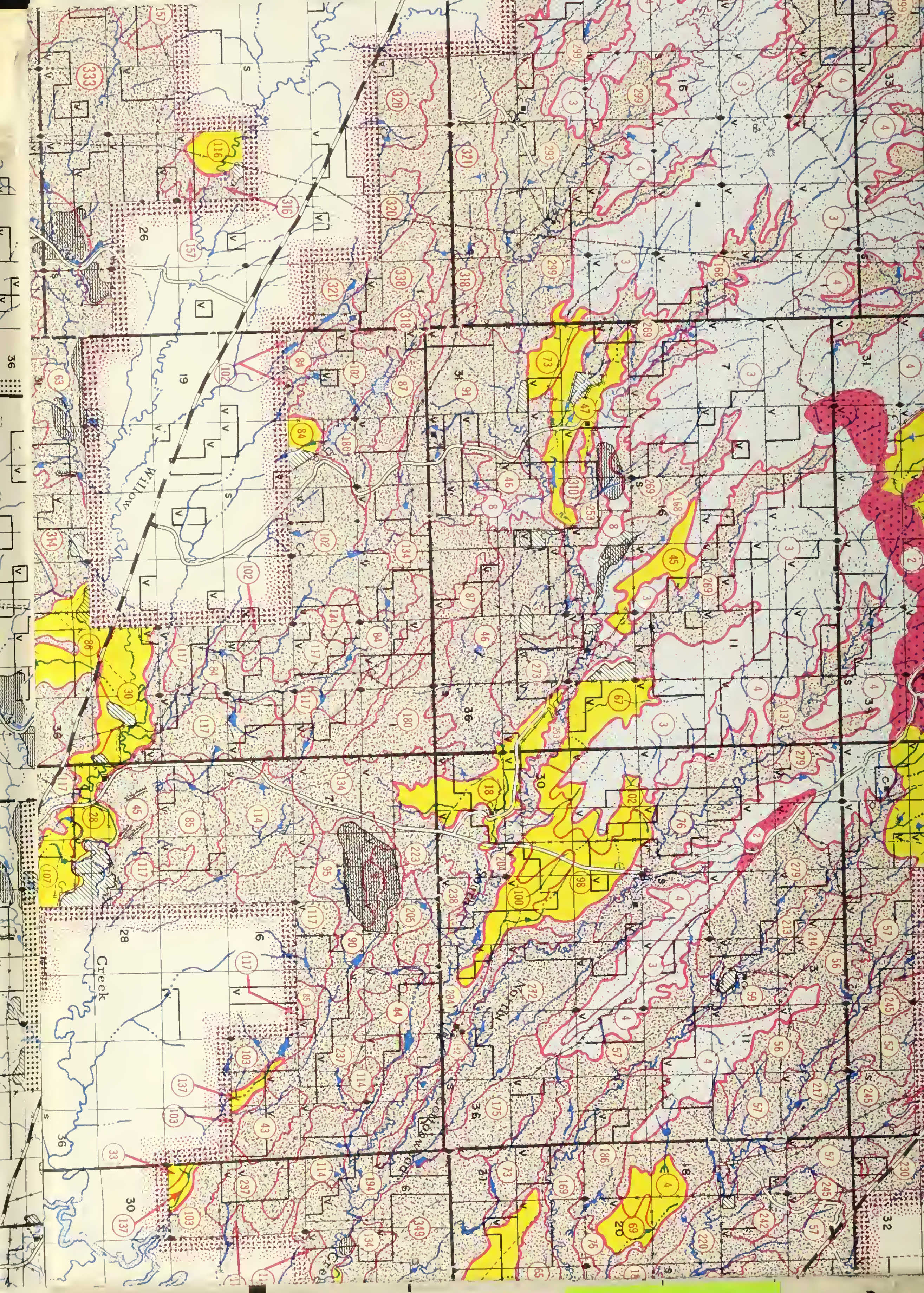


MISSOURI RIVER BASIN INVESTIGATIONS
AREA 3
Denver Drafting Office
Denver, Colorado
J. O. M. 1958 M. G. C.



EXPLANATION OF SYMBOLS IN FORMULA




Willow
Creek